

### SBIR Data Reporting / Graphing requirements

- Need interface to get/put information of school district, school region, school name, and class (with the option of retrieving this information directly from schools' student data files)
- Need interface to assign students to test versions and computer terminals
- Need to assign district, school region, school, class, and group ID and individual student ID numbers for storage and retrieval of data
- Display data as shown in the tables and graphs
- Display district, region, school, teacher, class, grade level on charts (see sample)
- Display name of test, CCI logo, copyright, disclaimer
- Use different colors for pre-test and post-test bars on graphs (maximum display of two (2) most recent test administrations)
- Need interface to assign ID number for storage and retrieval of data
- Display date of pre- and post- test, chronological age (date of test taken – date of birth), and grade of the student for individual student reports. Pre-test and post-test dates need to be labeled (see samples).

### SBIR Data Reports

- There are three data report formats for class teachers to access and two more data report forms for school level and above. For individual parents, only individual student data summary is provided.
  - ✓ Class Data Graphs (see the report samples on pages 4-7).
  - ✓ Class Comparison with Multi-State Sample Average Tables (see the report samples on page 9).
  - ✓ Individual Student Data Summary (see the report samples on pages 10-12: This report is a two-section table to show students' performance at their grade level and Full version level).
  - ✓ District/Region/School/Class Data Graphs & Tables (see the report samples on pages 14-16). Click "region" at district level to link to the school level graphs and click "school" at region level will link to the class level graphs. Click pre-test/post-test bar will link to pre-test/post-test database tables. The database will have the function of retrieving all the (school/class) students' data with search and sort capabilities (e.g., search grade level = 1 and Blending Phonemes > = 3; sort total score in descending order, etc.) The default fields for the table will be student name, 8 subtest total scores, total score for the test, and total time spent; 11 fields for pre-test and post-test respectively. (*link interface design needs to be discussed with Noah*)
  - ✓ Comparison of Regions/Schools/Classes to Multi-State Sample Average (see the report samples on pages 19-20)
- Landscape will be the default print layout for all graphs. Portrait will be the default print layout for all tables. There should be an option of Landscape or Portrait for printing.
- Teachers should be able to access a "first level button menu" from where they can click on the buttons to access the data they are interested and print the reports they need. The button's name reflects what information teachers can expect to get from this report. When the pointer moves inside the button area, a floating window showing the detail information about the reports in this branch (e.g., Answer your questions: What is the profile of relative strengths & weakness for my class ... – see document *Hyperlink Descriptions*). Reports are linked together. They can also be accessed by clicking on the buttons (hyperlinks) on another report.
- There will be six buttons on the "first level button menu" screen. They are

- Average Score on All Test Sections (Graph)
  - Total Score Comparison (Graph)
  - Class Comparison with Multi-State Sample Average (Table)
  - Individual Student Data Summary (Table)
  - District/Region/School/Class Data Graphs & Tables
  - Comparison of Regions/Schools/Classes to Multi-State Sample Averages (Table)
- For individual packages (packages for parents), only Individual Student Data Summary report is needed.
- Class teachers can only access their students' data, so when they access the "first level button menu", buttons for the school and above levels are inactive.
- There will be a Back button and a Menu button on all the graphs and tables. Clicking on Back button to bring the user to the previous screen (where it comes from) and on Menu button to bring the user to the first level button menu for another option.
- There will be a Print button on each data report screen, where teachers can click to print the report(s). When they click the Print button, a window pops up and provides the choices of "Print All", "Print Current Student/Subtest", and "Print ..."
- Print All: print all the reports of the form on the screen that the teacher is seeing. For example, if there are a total of 35 reports (students), they will all be printed at one time.
  - Print Current Student/Subtest: print the current report of the form on the screen that the teacher is seeing. For example, if there are a total of 35 students' records but on the screen that is Jim's report, only Jim's is printed out.
  - Print ....: there should be a pull-down menu with all the registered students' names for student reports or subtest names for subtest reports listed. Teacher can click to choose those he/she needs to print out. For example, the teacher can choose to print Jim, Lynn, and Susan's reports from 35 students.
- Names on the X axis will be first initial + last name or full name (will be based on how many characters are acceptable for the database)
- Text on the X and Y axes can change directions
- For District/Region/School/Class data, the access permission will be as follows:

Level	Access Permission	Grade level for comparison		
		Kindergarteners	First Graders	Second Graders
District access	Districts	✓	✓	✓
	Regions	✓	✓	✓
	Schools	✓	✓	✓
Region access	Regions	✓	✓	✓
	Schools	✓	✓	✓
School access	Schools	✓	✓	✓

**Formulas:**

Mean (Average):  $\bar{x} = \frac{1}{n} \sum x_i$  where  $n$  = observations (subject number)

Standard Deviation:  $SD = \sqrt{\frac{1}{n-1} \sum (x_i - \bar{x})^2}$

**Notes for Graphs and Tables:**

- Limited by space, the components of graphs are not proportionally sized. The layout of the graphs on screens should be designed such that 1) font for title should be bigger; 2) title should be placed in the center across top; 3) use right shapes / graphics for buttons, for example, right arrow for Go Next; 4) allow enough space between components on the screen; 5) everything on the screen should visually please eyes and be readable; and 6) use color but no more than 4 colors on each screen.)
- For those graphs that cannot show all the data at a time (e.g., sample graphs 2 and 3 for class data), there will be next and previous arrow buttons, and zoom-in and zoom-out buttons. Default for these graphs will be the first 10 records. Click the "next" arrow button to show the next 10 records and "previous" arrow button to show the previous 10 records. Click on the "zoom-out" button to see all the data, and "zoom-in" button to go back to default graph.
- For those graphs showing subtests on the x axis, the test item numbers should be variables. They will change based on different versions (e.g., in the sample graph, there are 12 test items for Rhyming, the number 12 should change to 15 if there are 15 test items).
- For all the bar graphs, there is a Data Values On/Off toggle button to provide the option of having or not having values on the graphs.
- On some graphs and tables, there will be a cycle-through button (see samples). They can be clicked to cycle through the eight subtests, 6 grade level versions\*, or the 35 students. (It will be replaced with a pull down / up menu for the user to select the items they'd like to have)
- There should be somewhere on the screen to let the user know how to use the cycle-through buttons (or pull down/up menu) to see different graphs or tables, and toggle buttons to access different mode.
- There will be a button on all the graph and table screens with the options of having a report displaying 1) all the test results, 2) Pre-test and the most recent post-test, and 3) the two most recent tests. (Definition: the first test is pre-test; the other tests are post-test (1...n))
- Display corresponding test dates for individual student's test result reports.

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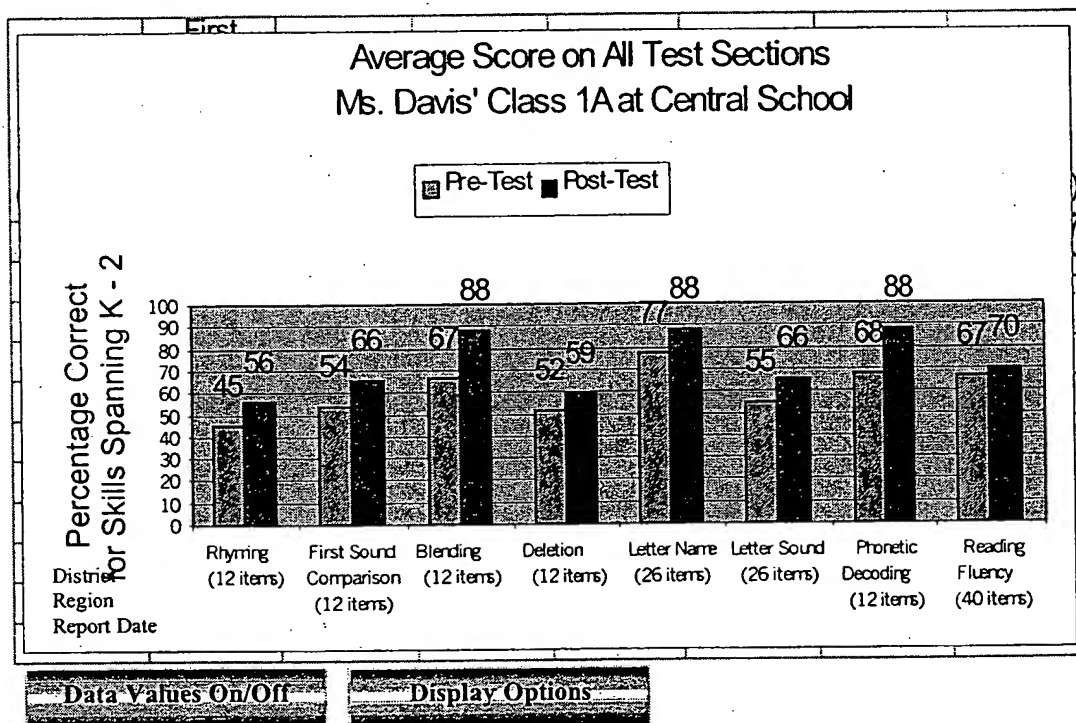
\* Kindergarten, First Grade, Second Grade, GradeK\_Full (full test), Grade1\_Full, and Grade2\_Full.

**Class Data Graphs**

1. Average score on all test sections (click on the subtest name (e.g., Rhyming) to view more detailed results for that subtest (graph 3))

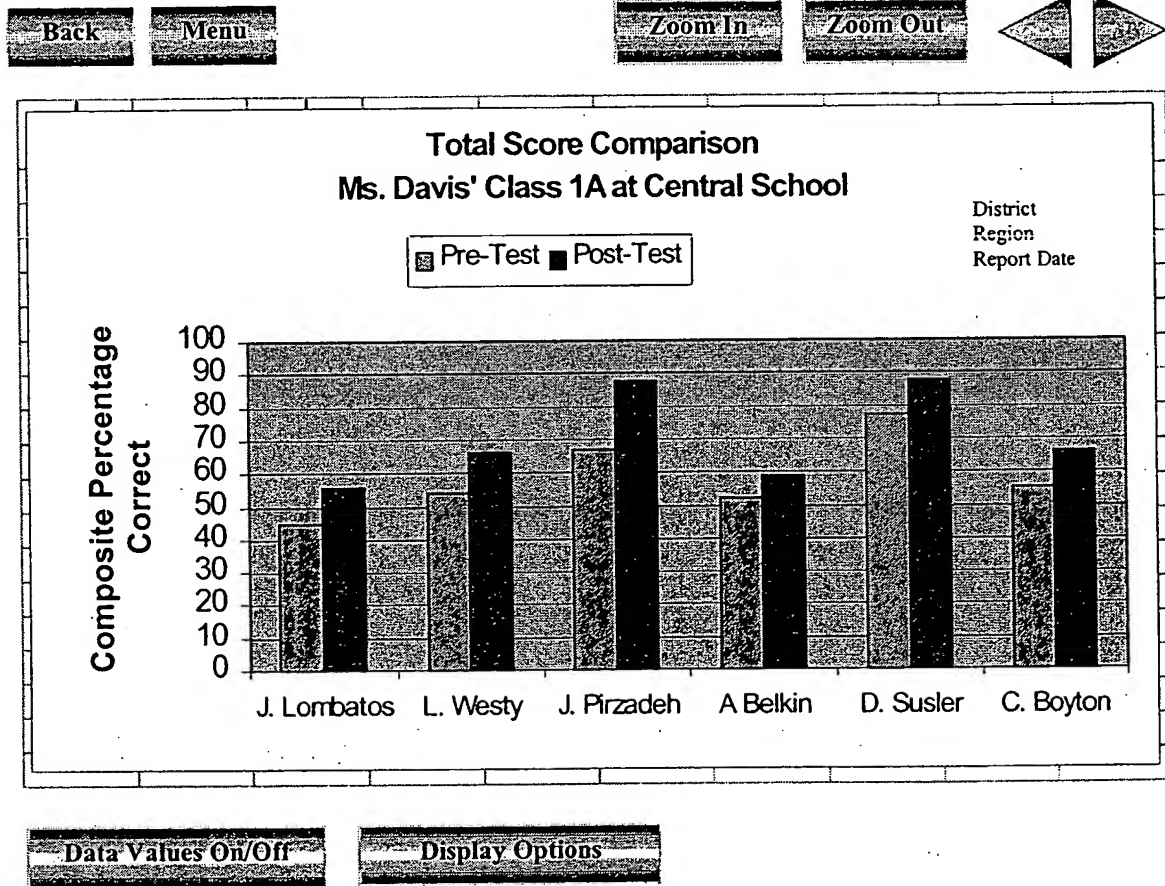
For whatever version of the test (KA, KB, 1A, 1B, 2A, 2B, FA, FB), the graph layout will be designed the same way; all the subtests will be displayed. However, only those available subtests will be highlighted (active); all the unavailable subtests will be inactive (gray out).

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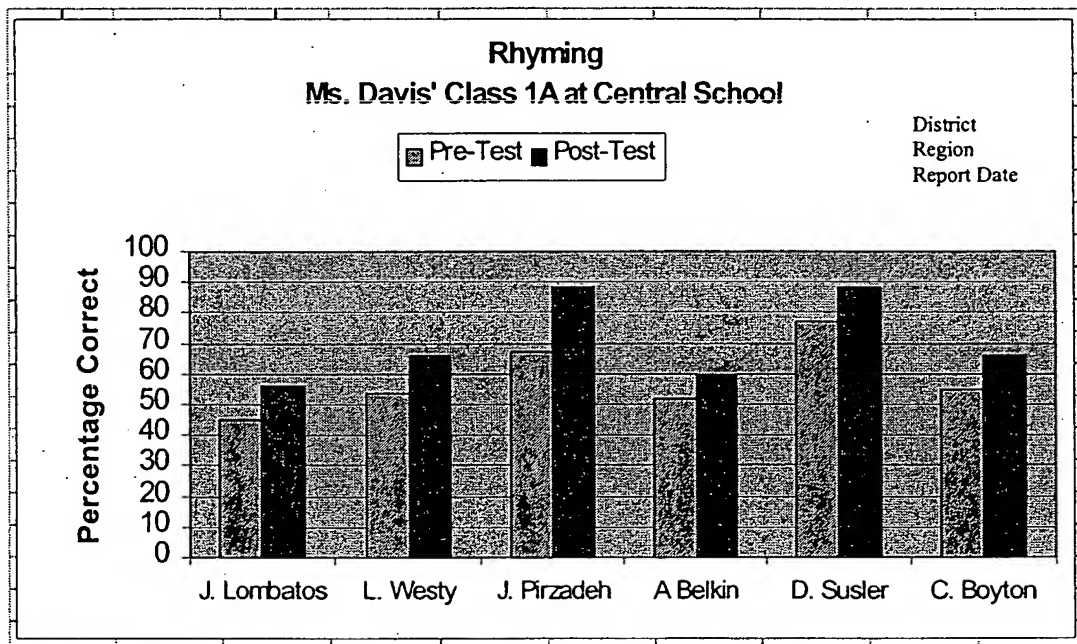


\* This is an example of having data values on. All the other graphs are examples having data values off.

2. Total score comparison (Student names will display evenly across the X axis; Click on the student's name (e.g., J. Lambatos) to view individual student performance on all subtests (graph 4))

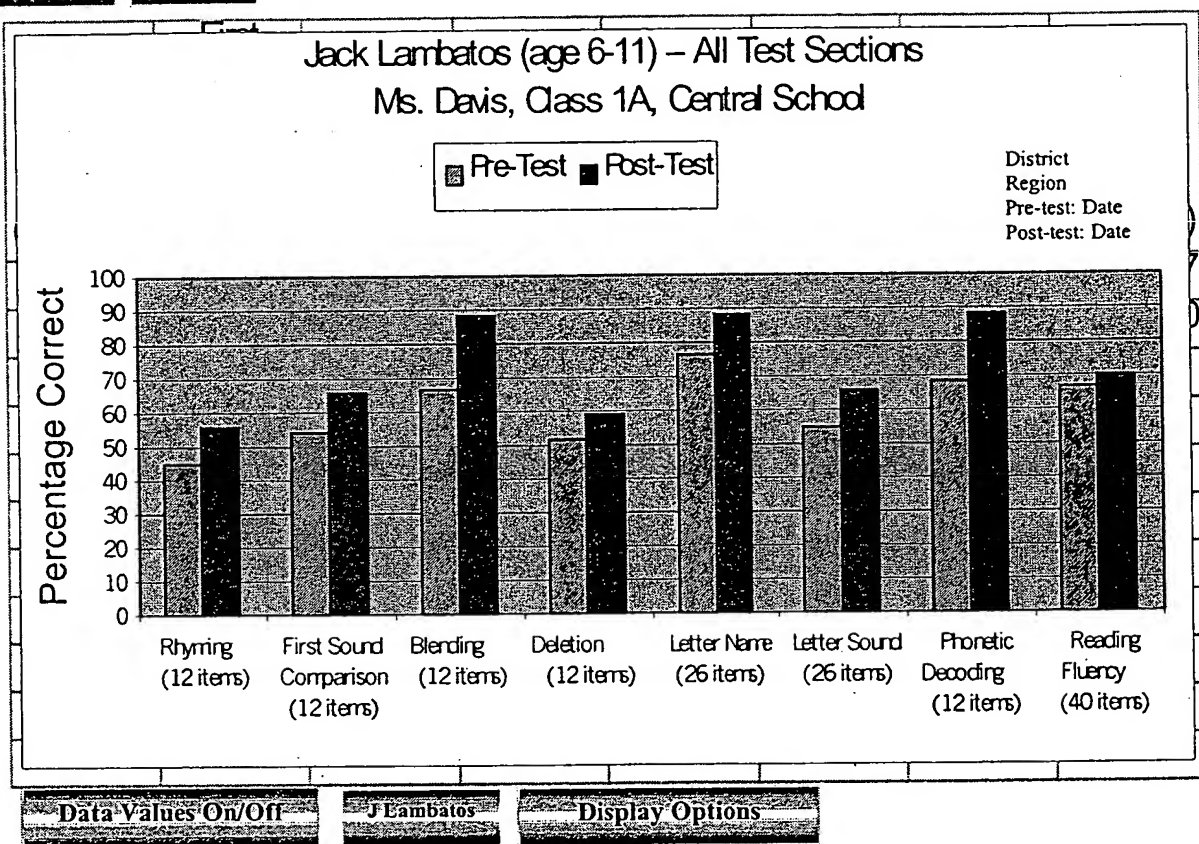


3. Students' performance on 1 sub-test (Student names will display evenly across the X axis; click on the student name to view the individual student's performance for all the subtests (graph 4); click on the button to see the corresponding Table: Comparison with Multi-State Sample Average.



4. Individual student performance on all subtests

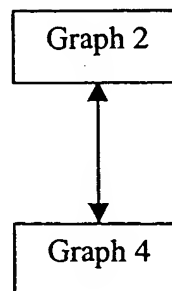
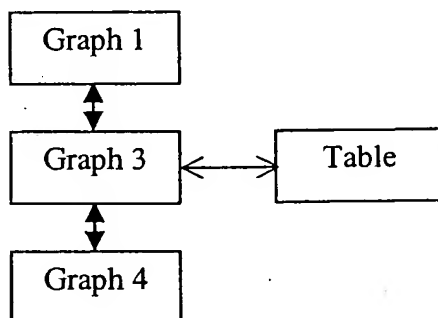
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The above are sample Data Graph reports. Sub-test (e.g., Rhyming), and student name (e.g., J. Lambatos) are clickable. When they are clicked, another graph will display on the screen. The following flowchart and table show the hyperlink behavior and the number of graphs for each level:

Hyperlink behavior

The down arrows ↓ show the flow through clicking on subtests or student names; the up arrows ↑ show the flow through clicking on the back button.



The back button on graph 4 should be able to go back where it comes from, that means, to recognize whether it comes from graph 2 or 3.

Number of graphs on each level (Here number indicates the number of graphs for each individual single test version package)

Graph (level)	Number	Name
Graph 1 (level 1)	1	Average Score on All Test Sections
Graph 2 (level 1)	1	Total Score Comparison
Graph 3 (level 2)	8	Rhyming
		First Sound Comparison
		Blending
		Deletion
		Letter Names
		Letter Sounds
		Phonemic Decoding Accuracy
		Reading Fluency
Graph 4 (level 2/3)	35 (Max)	Performance of <i>Student name</i> (age year – month) on All Test Sections



**Class Comparison with Multi-State Sample Average Table**

There will be a button at the first level named Class Comparison with Multi-State Sample Average. Clicking on this button will access an eight-button screen. Clicking on these buttons to access individual tables. The eight-button screen will include the following:

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Rhyming	Letter Names
First Sound Comparison	Letter Sounds
Blending	Phonemic Decoding Accuracy
Deletion	Reading Fluency

Clicking on one of the buttons (e.g., Rhyming) to access the following table (Comparison with Multi-State Sample Average). The pre-test scores are sorted in descending order with the sample average and the header of Pre-Test highlighted as default. The Multi-State Sample Average row is always highlighted. To see post-test scores in descending order compared with sample average, click on the header Post-Test. Then the header of Post-Test is highlighted.

**Rhyming**  
**Comparison with Multi-State Sample Average**  
**Ms. Davis' Class 1A at Central School**

District  
Region  
Report Date

	Student	Pre-Test	Post-Test
1	Jack. Lambatos	15	14
2	Leighton Pirzdeh	15	15
3	Joe Susler	14	15
4	Anna Boyston	13	13
5	David Westy	11	14
	<b>Multi-State Sample Average<sup>1</sup></b>	<b>10</b>	
6	Christy Belkin	8	11
...	...	...	

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**Rhyming**

**Display Options**

- To see post-test scores in descending order compared with sample average, click on the header Post-Test.
- Click on each student's name to access Individual Student's Data Summary.

<sup>1</sup> Based on performance of n = 600 from CA, IL, FL.

**Individual Student Data Summary**

This report can also be accessed through the "Individual Student Data Summary" button on the "first level button menu" screen. This report includes two test levels (grade level and full test) for each individual student. Items correct of the test taken, including test number and percentage, are shown in the table.

**Test Report for Melissa (Kindergarten, Age 5-3)**

District  
Region  
School  
Report Date

Test Sections	Number of Test Items	Items Correct				Test Sample Average Scores <sup>1</sup>
		Pre-Test		Post-Test		
		Date		Date		
Kindergarten version		No.	%	No.	%	Sample size =
Rhyming	12	12	100%			Average =
First Sound Comparison	12	9	75%			
Blending	12	6	50%			
Deletion	12	9	75%			
Letter Names	26	20	77%			
Letter Sounds	26	20	77%			
Full version		Date		Date		Sample size F = Sample size KF = Sample size 1F = Sample size 2F = <sup>2</sup>
		No.	%	No.	%	
Rhyming	12					Average F = Average KF = Average 1F = Average 2F = <sup>3</sup>
First Sound Comparison	12					
Blending	12					
Deletion	12					
Letter Names	26					
Letter Sounds	26					
Phonemic Decoding Accuracy	12					
Reading Fluency	40					

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Melissa

Display Options

<sup>1</sup> Based on preliminary data gathered from sample (n = 450) in TN, OH, FL, and IL.

<sup>2</sup> Sample size F = (sample size of all those who took Full version); Sample size KF = (sample size of all K graders who took Full version); Sample size 1F = (sample size of all first graders who took Full version); Sample size 2F = (sample size of all second graders who took Full version); For a student report, only Sample size F and the sample size for that student's grade (e.g., for kindergarten student report, show Sample size F and Sample size KF) need to be shown in the report.

<sup>3</sup> Average F = (Average score of all those who took Full version); Average KF = (Average score of all those K graders who took Full version); Average 1F = (Average score of all those first graders who took Full version); Average 2F = (Average score of all those second graders who took Full version); For a student report, only Average F and the average for that student's grade (e.g., for kindergarten student report, show Average F and Average KF) need to be shown in the report.

## Test Report for Juanita (First Grade, Age 6-10)

District  
Region  
School  
Report Date

Test Sections	Number of Test Items	Items Correct				Test Sample Average Scores <sup>1</sup>
		Pre-Test		Post-Test		
		Date		Date		
First grade version		No.	%	No.	%	$n_1 =$ (sample size)
Blending	12	10	80%			$\bar{x}_1 =$
Deletion	12	12	100%			
Phonemic Decoding Accuracy	12	9	75%			
Reading Fluency	40	30	75%			
Full version		Date		Date		$n_F, n_{KF}, n_{1F}, n_{2F}^2$
		No.	%	No.	%	
Rhyming	12					$\bar{x}_F =$
First Sound Comparison	12					$\bar{x}_{KF} =$
Blending	12					$\bar{x}_{1F} =$
Deletion	12					$\bar{x}_{2F} =$
Letter Names	26					
Letter Sounds	26					
Phonemic Decoding Accuracy	12					
Reading Fluency	40					

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Juanita

Display Options

<sup>1</sup> Based on preliminary data gathered from sample ( $n = 600$ ) in CA, FL, and IL.

<sup>2</sup>  $n_F$  = (sample size of all those who took Full version);  $n_{KF}$  = (sample size of all K graders who took Full version);  $n_{1F}$  = (sample size of all first graders who took Full version);  $n_{2F}$  = (sample size of all second graders who took Full version)

**Test Report for Tyron (Second Grade, Age 7-9)**

District  
Region  
School  
Report Date

Test Sections	Number of Test Items	Items Correct				Test Sample Average Scores <sup>1</sup>
		Pre-Test		Post-Test		
		Date		Date		
Second grade version		No.	%	No.	%	$n_2 = (\text{sample size})$
Deletion	12	9	75%			$\bar{x}_2 =$
Phonemic Decoding Accuracy	12	6	50%			
Reading Fluency	40	32	80%			
Full version		Date		Date		$n_F, n_{KF}, n_{1F}, n_{2F}^2$
		No.	%	No.	%	
Rhyming	12					$\bar{x}_F =$
First Sound Comparison	12					$\bar{x}_{KF} =$
Blending	12					$\bar{x}_{1F} =$
Deletion	12					$\bar{x}_{2F} =$
Letter Names	26					
Letter Sounds	26					
Phonemic Decoding Accuracy	12					
Reading Fluency	40					

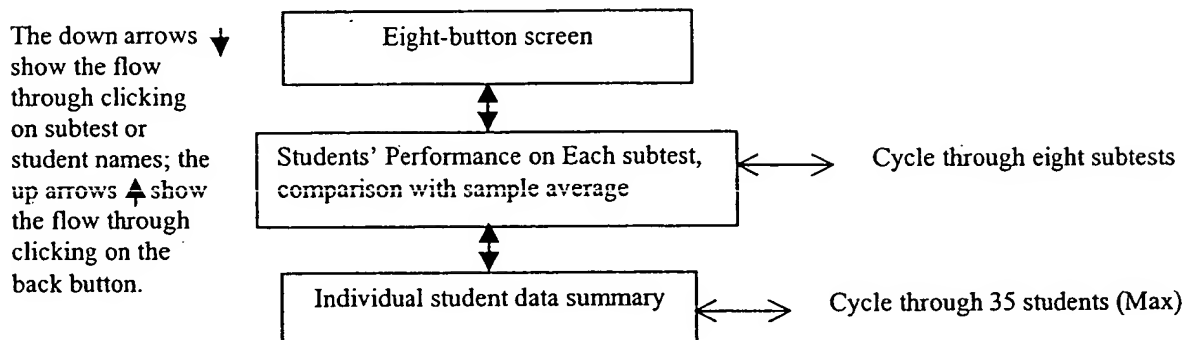
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<sup>1</sup> Based on preliminary data gathered from sample ( $n = 600$ ) in CA, FL, and IL.

<sup>2</sup>  $n_F$  = (sample size of all those who took Full version);  $n_{KF}$  = (sample size of all K graders who took Full version);  $n_{1F}$  = (sample size of all first graders who took Full version);  $n_{2F}$  = (sample size of all second graders who took Full version)

The above are sample Data Tables and Summary reports. Clicking on students' names and the cycle-through buttons will move to another report. The following flowchart and table show the hyperlink behavior and the number of reports for each level:

Hyperlink behavior



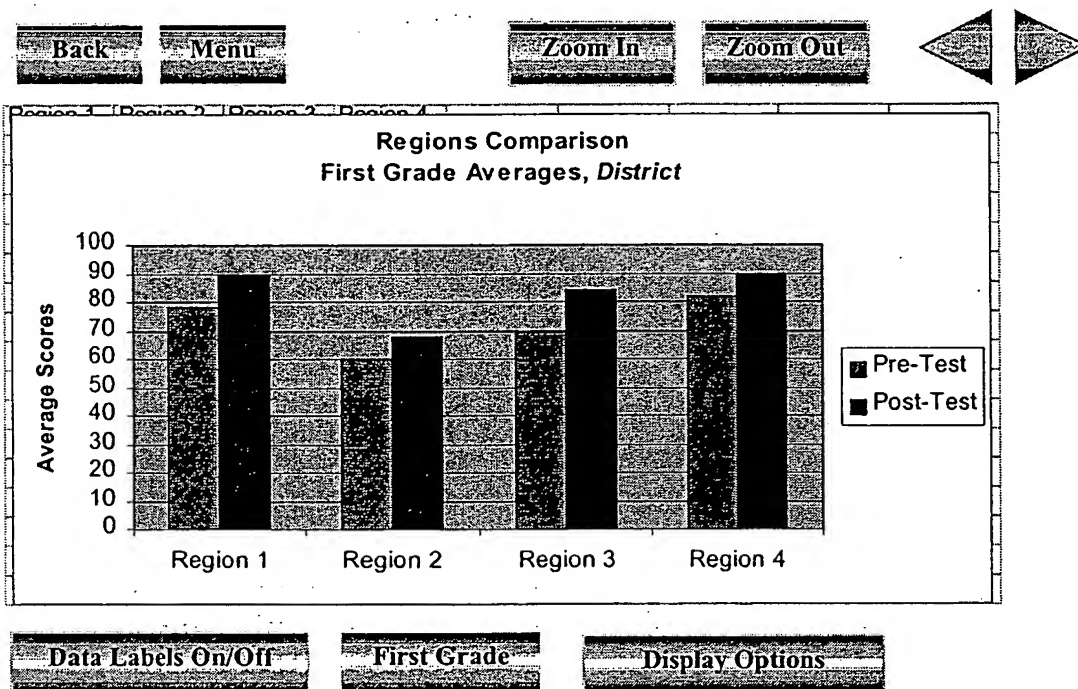
Number of reports on each level (Here number indicates the number of graphs for each individual single test version package)

Graph (level)	Number	Name
Eight button level	1	N/A
Report level 1	8	Rhyming: Comparison with Multi-State Sample Average
		First Sound Comparison: Comparison with Multi-State Sample Average
		Blending: Comparison with Multi-State Sample Average
		Deletion: Comparison with Multi-State Sample Average
		Letter Names: Comparison with Multi-State Sample Average
		Letter Sounds: Comparison with Multi-State Sample Average
		Phonemic Decoding Accuracy: Comparison with Multi-State Sample Average
		Reading Fluency: Comparison with Multi-State Sample Average
Report level 2	35 (Max)	Test Report for Student name (age year-month)

**District/Region/School/Class Data Graphs & Tables**

When the "Comparison of Regions/Schools/Classes to Multi-State Sample Average" button on the "first level button menu" screen is clicked, districts can directly access the following graph 1; regions can directly access the following graph 2; and schools can directly access the following graph 3. Lower level graphs can also be accessed through higher level graphs.

1. For School Districts (click the region name to access the graphs for all the schools' data; click the bars to access database tables for pre-test/post-test scores, where teachers can use sort and search functions to sort/search region information needed)



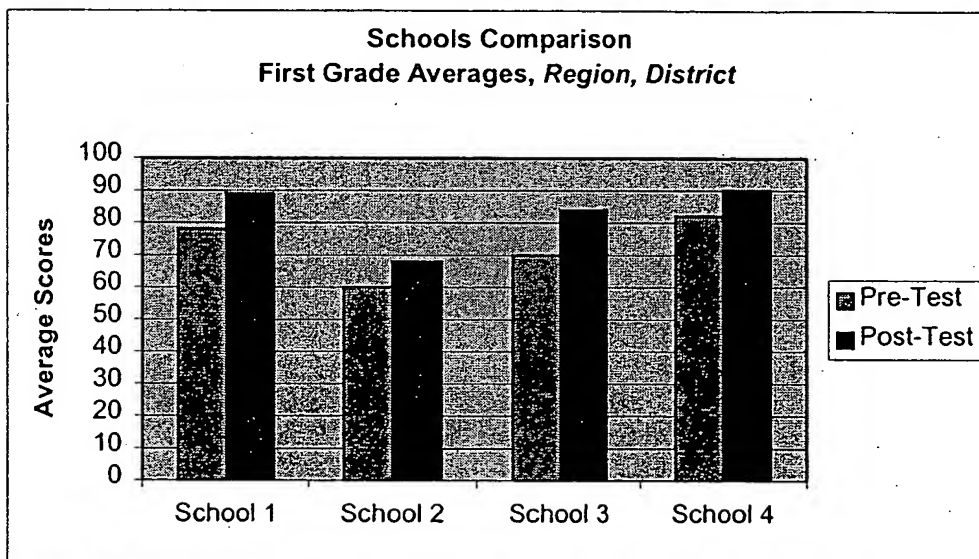
2. For Regions (click the school name to access the graphs for all the school classes' data – three separate graphs of for Kindergarteners, for First Graders, and for Second Graders; click the bars to access database tables for pre-test/post-test scores, where teachers can use sort and search functions to sort/search school information needed)

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Zoom In

Zoom Out

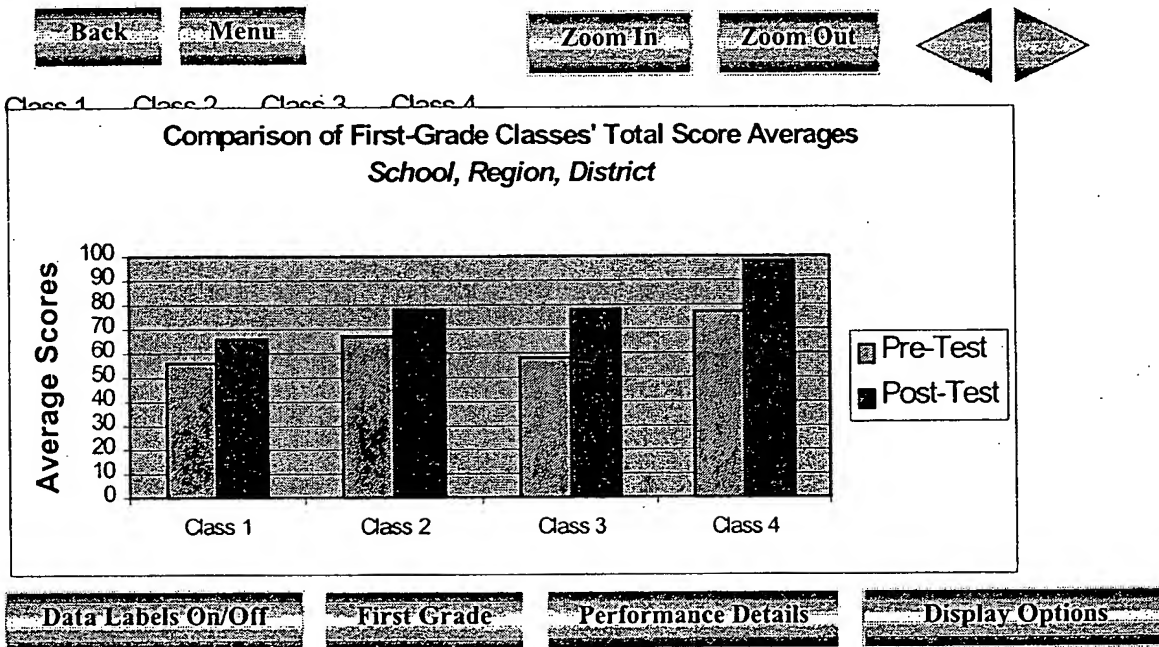


Data Labels On/Off

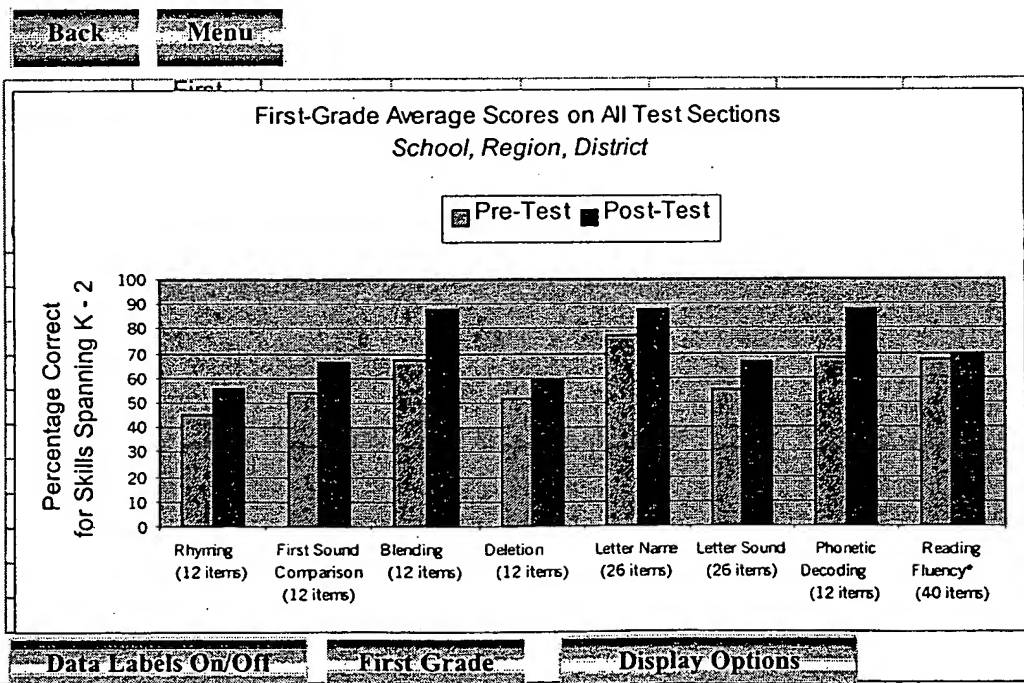
First Grade

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3. For Schools (click the Performance Details button to access For School Performance Details graph; click the bars to access database tables for pre-test/post-test scores, where teachers can use sort and search functions to sort/search class information needed)



4. For School Performance Details (the test item numbers should be variables. They will change based on different versions (e.g., in the sample graph, there are 12 test items for Rhyming, the number 12 will change to 15 if there are 15 test items)).

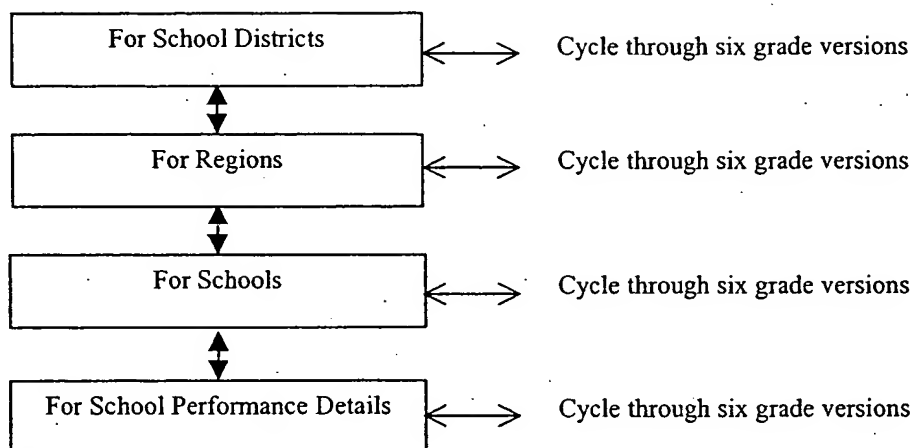




The above are sample Data Graph reports at district, region, and school levels. The following flowchart and table show the hyperlink behavior and the number of reports for each level:

Hyperlink behavior

The down arrows ↓ show the flow through clicking on corresponding buttons; the up arrows ↑ show the flow through clicking on the back button.



Number of reports on each level

Graph (level)	Number	Name
For school districts (level 1)	6	Regions Comparison: Kindergarten Averages, <i>District</i>
		Regions Comparison: First Grade Averages, <i>District</i>
		Regions Comparison: Second Grade Averages, <i>District</i>
		Regions Comparison: GradeK_Full Averages, <i>District</i>
		Regions Comparison: Grade1_Full Averages, <i>District</i>
		Regions Comparison: Grade2_Full Averages, <i>District</i>
For regions (level 2)	6	Schools Comparison: Kindergarten Averages, <i>Region, District</i>
		Schools Comparison: First Grade Averages, <i>Region, District</i>
		Schools Comparison: Second Grade Averages, <i>Region, District</i>
		Schools Comparison: GradeK_Full Averages, <i>Region, District</i>
		Schools Comparison: Grade1_Full Averages, <i>Region, District</i>
		Schools Comparison: Grade2_Full Averages, <i>Region, District</i>
For schools (level 3)	6	Classes Comparison: Kindergarten Averages, <i>School, Region, District</i>
		Classes Comparison: : First Grade Averages, <i>School, Region, District</i>
		Classes Comparison: Second Grade Averages, <i>School, Region, District</i>

		Classes Comparison: GradeK_Full Averages, <i>School, Region, District</i>
		Classes Comparison: Grade1_Full Averages, <i>School, Region, District</i>
		Classes Comparison: Grade2_Full Averages, <i>School, Region, District</i>
For school performance details (Level 4)	6	Kindergarten Average Scores on All Test Sections <i>School, Region, District</i>
		First Grade Average Scores on All Test Sections <i>School, Region, District</i>
		Second Grade Average Scores on All Test Sections <i>School, Region, District</i>
		GradeK_Full Average Scores on All Test Sections <i>School, Region, District</i>
		Grade1_Full Average Scores on All Test Sections <i>School, Region, District</i>
		Grade2_Full Average Scores on All Test Sections <i>School, Region, District</i>

**Comparison with multi-state sample averages across Regions/Schools/Classes**

There will be a button at the first level named Comparison of Regions/Schools/Classes to Multi-State Sample Average. Clicking on this button will access a three-button screen. Clicking on these buttons to access individual tables. The three-button screen will include the following:



Comparison across Regions
Comparison across Schools
Comparison across Classes

When districts access to this screen all the buttons are active; when regions access this screen, Comparison across Regions are inactive; When schools access this screen, only Comparison across Classes button is active. Clicking on a button to access the following table accordingly. The default table will be Comparison on Rhyming. The pre-test scores are sorted in descending order with the sample mean and the header of Pre-Test highlighted as default. To see post-test scores in descending order compared with sample mean, click on the header Post-Test. Then the header of Post-Test is highlighted. Click on individual Region/school can access this region/school's Comparison with Multi-State Sample Average across Schools/Classes table.

**Rhyming**  
**Comparison of Regions to Multi-State Sample Average**  
**Grade 1, Full, District**

Report Date

	Region	N	Mean Percentage Correct	
			Pre-Test	Post-Test
1	Region 3	23	90%	92%
2	Region 5	26	88%	88%
3	Region 2	22	86%	90%
4	Region 1	30	86%	89%
5	Region 6	25	79%	79%
	Multi-State Sample Average <sup>1</sup>		78%	
6	Region 4	26	77%	79%
...	...		...	...

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- To see post-test scores in descending order compared with sample average, click on the header Post-Test.
- Click on each region's name to access Comparison of Schools to Multi-State Sample Average.

**Rhyming**  
**Comparison of Schools to Multi-State Sample Average**  
**Grade 1, Full, Region, District**

Report Date

	School	N	Mean Percentage Correct	
			Pre-Test	Post-Test
1	School 3	23	90%	92%
2	School 5	26	88%	88%
3	School 2	22	86%	90%
4	School 1	30	86%	89%
5	School 6	25	79%	79%
	Multi-State Sample Average <sup>1</sup>		78%	
6	School 4	26	77%	79%
...	...		...	...

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- To see post-test scores in descending order compared with sample average, click on the header Post-Test.
- Click on each school's name to access Comparison of Classes to Multi-State Sample Average.

<sup>1</sup> Based on performance of n = 450 from CA, IL, FL.

**Rhyming**

**Comparison of Classes to Multi-State Sample Average**

**Grade 1, Full, School, Region, District**

Report Date

	Class	N	Mean Percentage Correct	
			Pre-Test	Post-Test
1	Class 3	23	90%	92%
2	Class 5	26	88%	88%
3	Class 2	22	86%	90%
4	Class 1	30	86%	89%
5	Class 6	25	79%	79%
	<b>Multi-State Sample Average<sup>1</sup></b>		<b>78%</b>	
6	Class 4	26	77%	79%
...	...		...	...

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**Rhyming**

**Grade 1 Full**

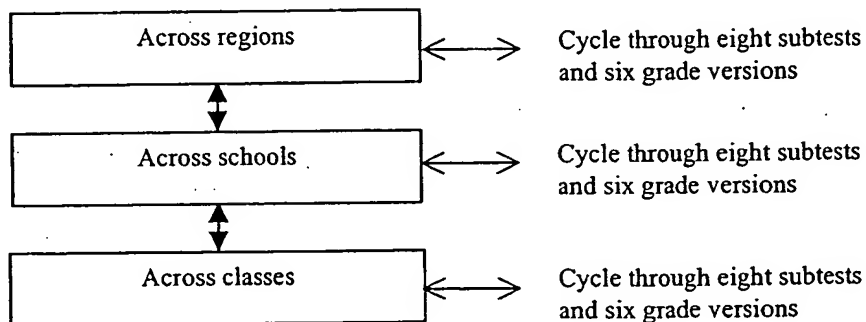
**Display Options**

- To see post-test scores in descending order compared with sample average, click on the header Post-Test.

The above are sample Data Table reports at district, region, and school levels. The following flowchart and table show the hyperlink behavior and the number of reports for each level:

Hyperlink behavior

The down arrows ↓ show the flow through clicking on region/school names; the up arrows ↑ show the flow through clicking on the back button.



<sup>1</sup> Based on performance of n = 450 from CA, IL, FL.

Number of reports on each level

Table (level)	Number	Name
For school districts (level 1)	8 x 6	Rhyming: Comparison of Regions to Multi-State Sample Average <i>Grade version, District</i>
		First Sound Comparison: Comparison of Regions to Multi-State Sample Average <i>Grade version, District</i>
		Blending: Comparison of Regions to Multi-State Sample Average <i>Grade version, District</i>
		Deletion: Comparison of Regions to Multi-State Sample Average <i>Grade version, District</i>
		Letter Names: Comparison of Regions to Multi-State Sample Average <i>Grade version, District</i>
		Letter Sounds: Comparison of Regions to Multi-State Sample Average <i>Grade version, District</i>
		Phonemic Decoding Accuracy: Comparison of Regions to Multi-State Sample Average <i>Grade version, District</i>
		Reading Fluency: Comparison of Regions to Multi-State Sample Average <i>Grade version, District</i>
For regions (level 2)	8 x 6	Rhyming: Comparison of Schools to Multi-State Sample Average <i>Grade version, Region, District</i>
		First Sound Comparison: Comparison of Schools to Multi-State Sample Average <i>Grade version, Region, District</i>
		Blending: Comparison of Schools to Multi-State Sample Average <i>Grade version, Region, District</i>
		Deletion: Comparison of Schools to Multi-State Sample Average <i>Grade version, Region, District</i>
		Letter Names: Comparison of Schools to Multi-State Sample Average <i>Grade version, Region, District</i>

		Letter Sounds: Comparison of Schools to Multi-State Sample Average <i>Grade version, Region, District</i>
		Phonemic Decoding Accuracy: Comparison of Schools to Multi-State Sample Average <i>Grade version, Region, District</i>
		Reading Fluency: Comparison of Schools to Multi-State Sample Average <i>Grade version, Region, District</i>
For schools (level 3)	8 x 6	Rhyming: Comparison of Classes to Multi-State Sample Average <i>Grade version, School, Region, District</i>
		First Sound Comparison: Comparison of Classes to Multi-State Sample Average <i>Grade version, School, Region, District</i>
		Blending: Comparison of Classes to Multi-State Sample Average <i>Grade version, School, Region, District</i>
		Deletion: Comparison of Classes to Multi-State Sample Average <i>Grade version, School, Region, District</i>
		Letter Names: Comparison of Classes to Multi-State Sample Average <i>Grade version, School, Region, District</i>
		Letter Sounds: Comparison of Classes to Multi-State Sample Average <i>Grade version, School, Region, District</i>
		Phonemic Decoding Accuracy: Comparison of Classes to Multi-State Sample Average <i>Grade version, School, Region, District</i>
		Reading Fluency: Comparison of Classes to Multi-State Sample Average <i>Grade version, School, Region, District</i>

**Raw Scores and Response Time for Each Student** (This design is for CCI research – data analysis)

Student ID	Test Item 1.1				
	Response <sup>1</sup>	C (1) / I (0) <sup>2</sup>	R(1)/NR(0) <sup>3</sup>	Response Time (sec) <sup>4</sup>	Time Run-out <sup>5</sup>
Student 1	3	1	1	2	0
Student 2	9	0	1	40	1
Student 3	4	0	0	2	0
Student 4	3	1	0	3	0
Student 5	2	0	0	1	0
Student 6	9	0	1	35	1
Student 7	3	1	0	20	0
Student 8	2	0	1	20	0
Student 9	3	1	1	25	1

#### Statistics

Mean correct	Standard Deviation	Mean Time	Other
➤ Individual student test mean for each test item category	➤ Standard Deviation for Individual student test of each test item category	Mean time for Individual student test of each test item category	➤
➤ Individual student subtest mean	➤ Standard Deviation for Individual student subtest	Individual student subtest mean time	
➤ Individual student total test mean	➤ Standard Deviation for Individual student total test	Individual student total test mean time	
➤ Group mean for each test item <sup>6</sup>	➤ Standard Deviation for each test item in a group	Group mean time for each test item	
➤ Group mean for each test item category	➤ Standard Deviation for each test item category in a group	Group mean time for each test item category	
➤ Group mean for each subtest	➤ Standard Deviation for each subtest in a group	Group mean time for each subtest	
➤ Group mean for total test	➤ Standard Deviation for total test in a group	Group mean time for total test	

<sup>1</sup> One (1) to six (6) are used as students' response to test items; e.g., there are four choices for the test items in subtest one. They will be labeled as 1 to 4. If the student clicks the third picture, it will be recorded as 3. Nine (9) is recorded as no response.

<sup>2</sup> One (1) for correct answer and 0 for incorrect answer.

<sup>3</sup> One (1) for having presented instructions twice and 0 for having presented instructions only once.

<sup>4</sup> When there is no response for 20 seconds, instructions will be repeated automatically; if there is no response for another 20 seconds, the screen flips to the next test item. No response will be coded as 0 (incorrect) and time 40 seconds (see student 2). Instructions can only be repeated once. If the student clicks repeat button but does not answer the question for 20 seconds from the repeated instruction, the screen will flip to the next test item (see student 6).

<sup>5</sup> One (1) for time run-out (see student 2) and 0 for student spending 20 seconds to answer the question before the instruction is repeated (see student 7).

<sup>6</sup> Group mean for each test item will be for internal analysis only

**Access to data**

- CCI has secured access to all the data recorded (need statement of security and permission)
- School districts have secured access to their school district students' data
- Regions have secured access to their region school students' data
- Schools have secured access to their school students' data
- Class teachers have secured access to their class students' data
- Parents have secured access to their own children's data

**Other**

- Include an On/Off option for limiting time allowed for user responses<sup>1</sup>
- Include an On/Off option for limiting number of times instructions repeated<sup>2</sup>

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<sup>1</sup> Add disclaimers: Turning off limited time for response and/or limited repetition of instructions prevents valid assessment of skills and comparison of scores across subjects and comparison of pre-test vs. post-test.





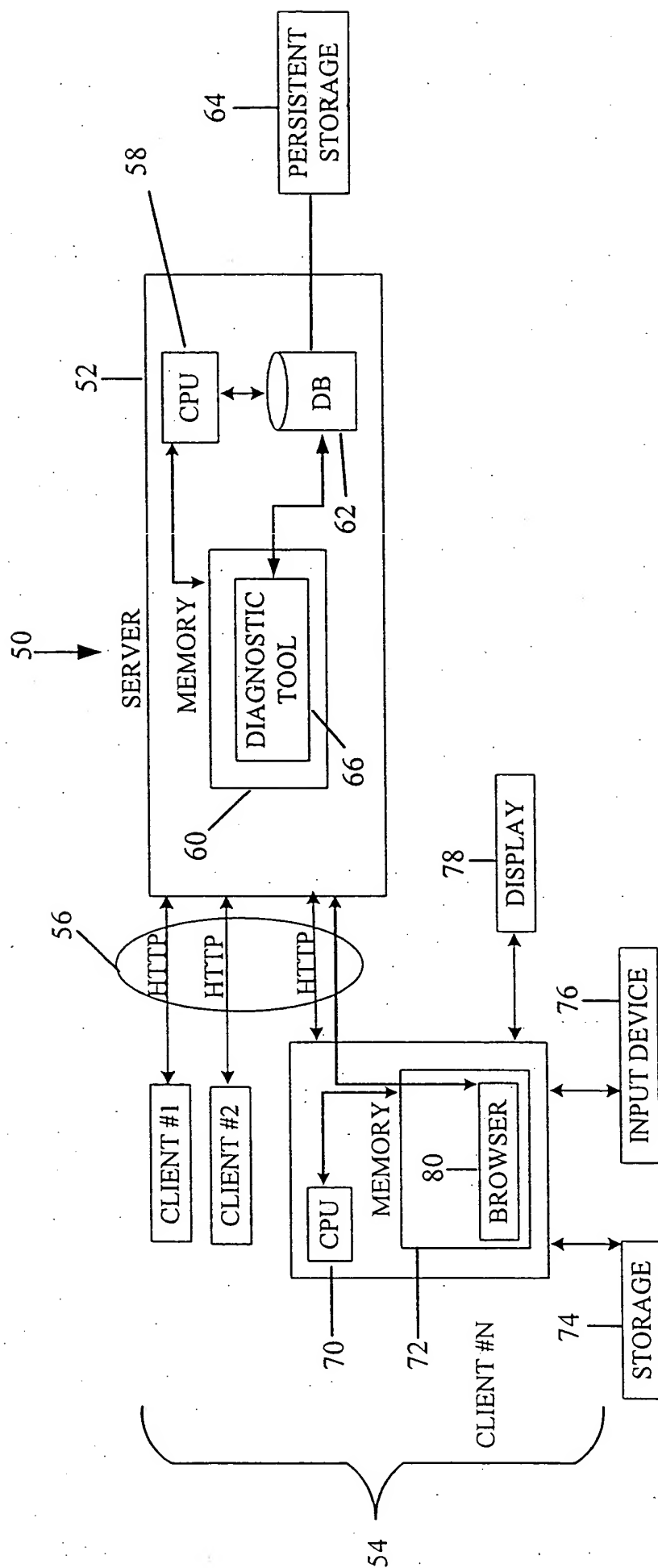


Figure 1A

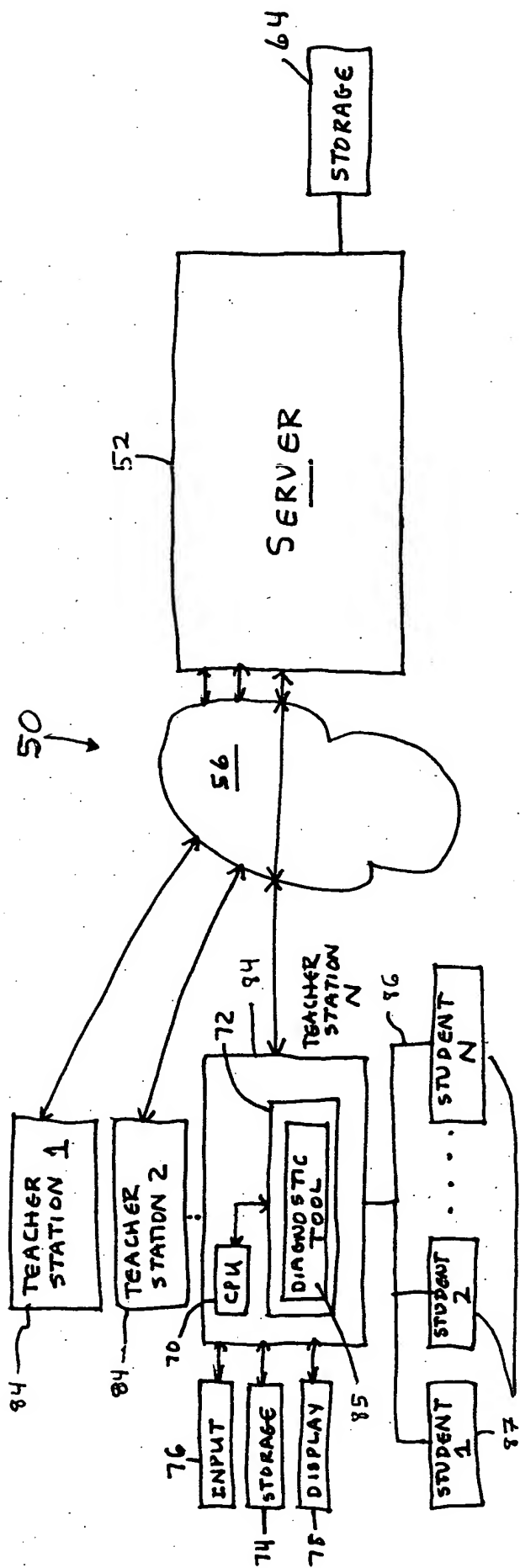


FIGURE 1B

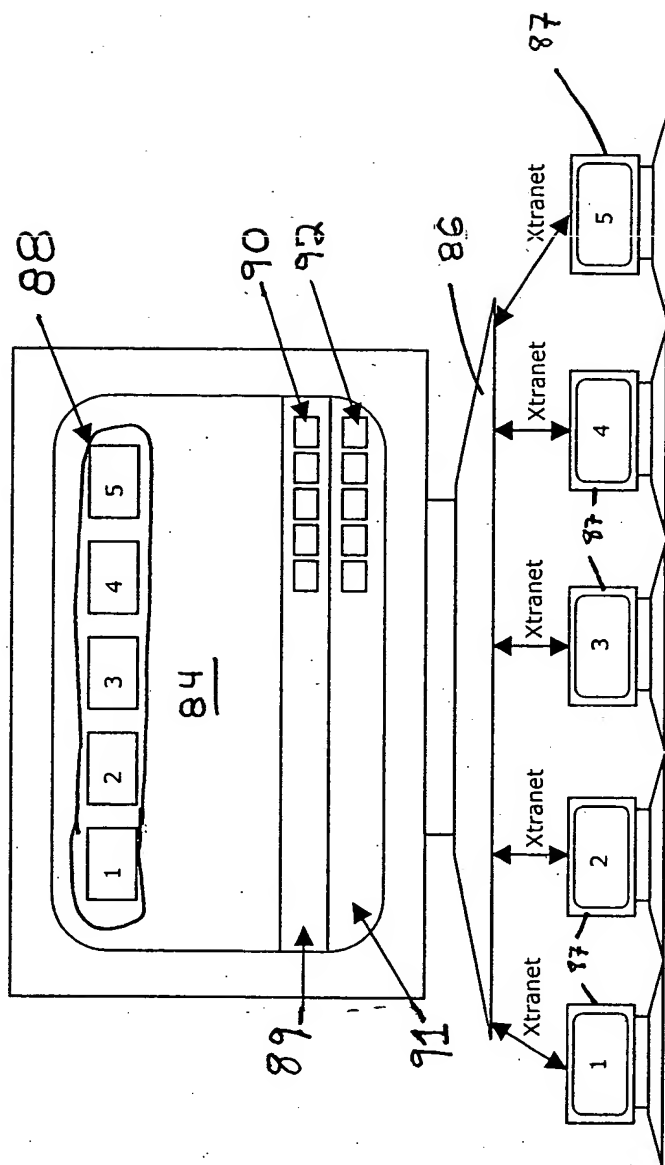


FIGURE 1C

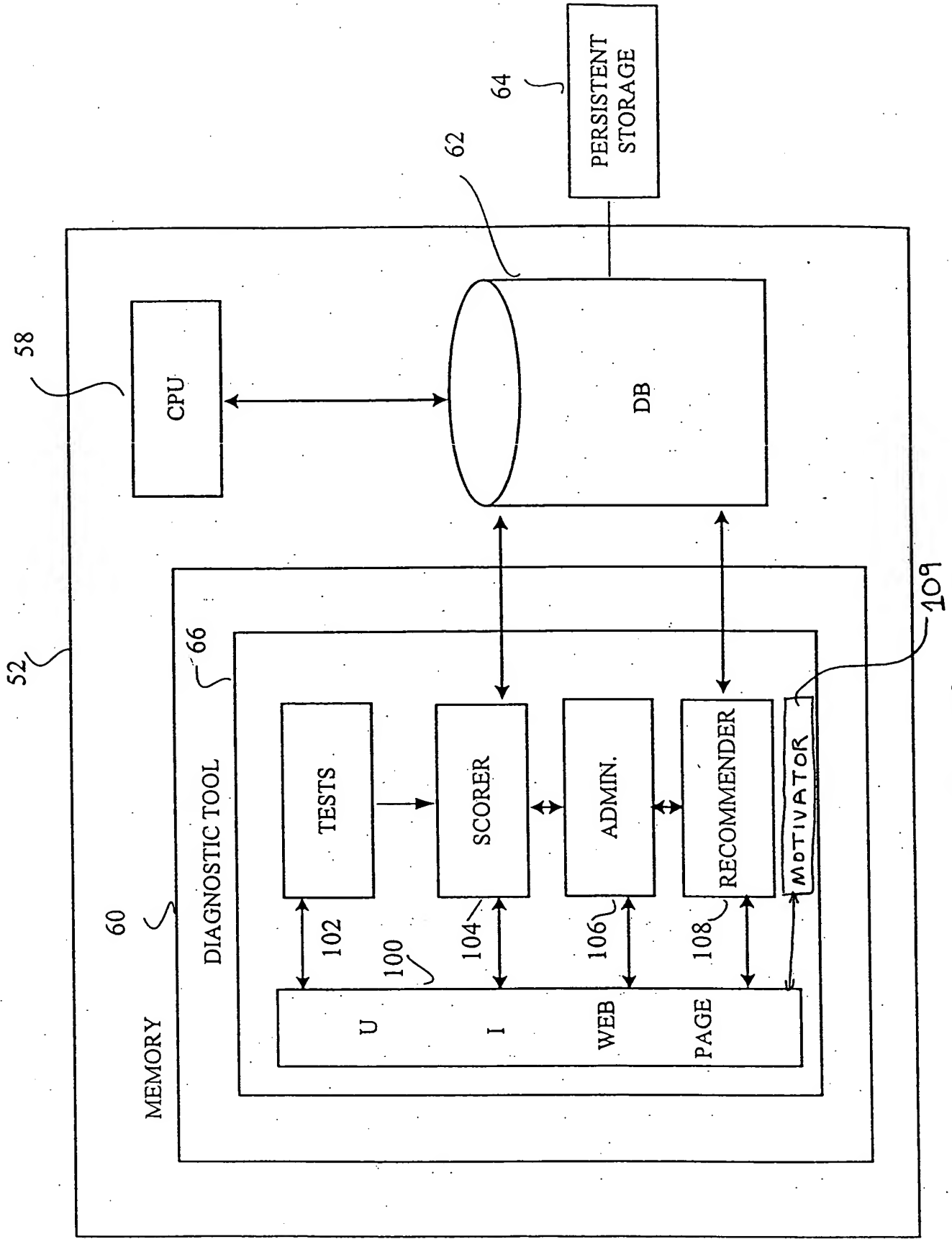


Figure 2

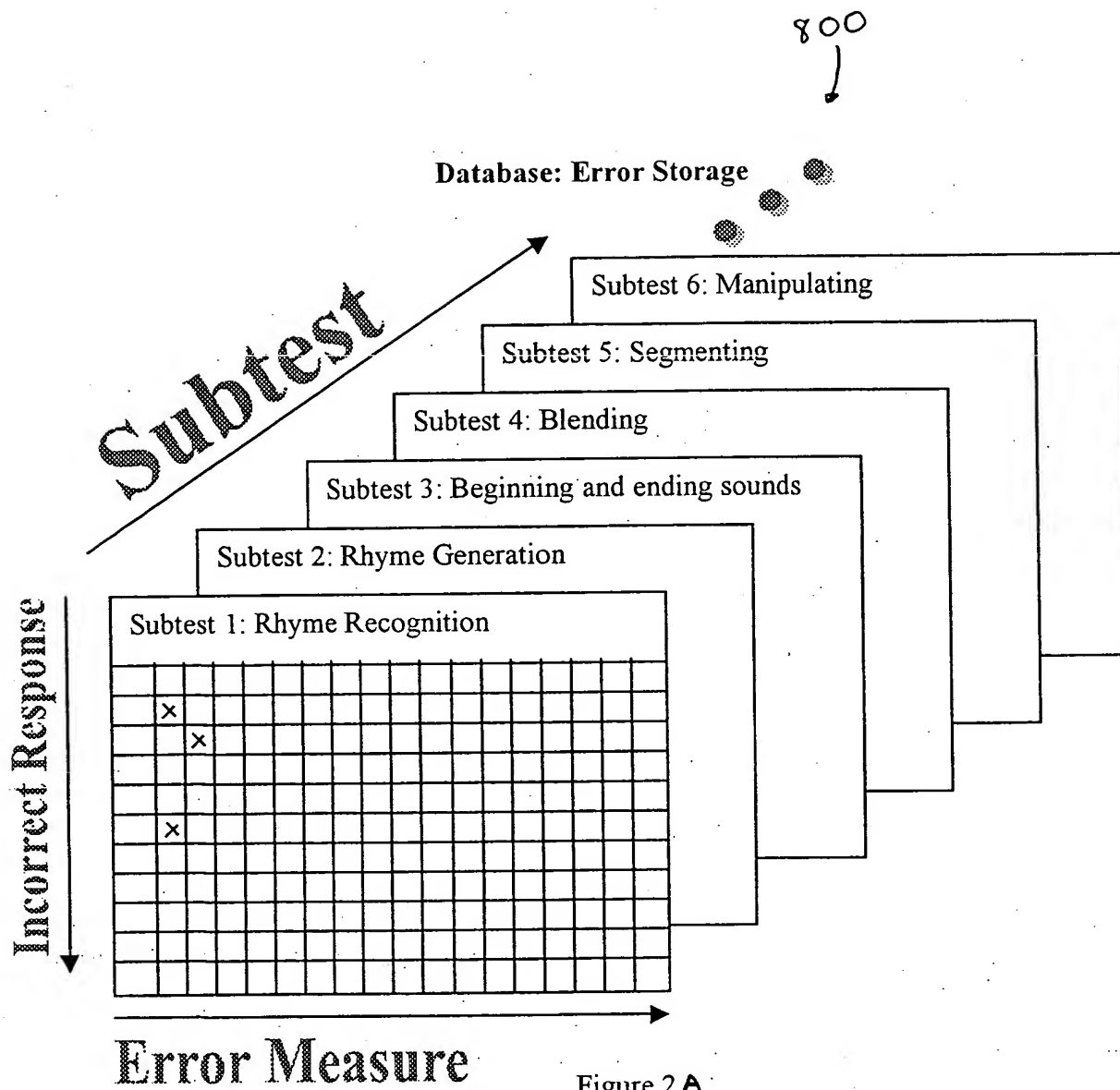
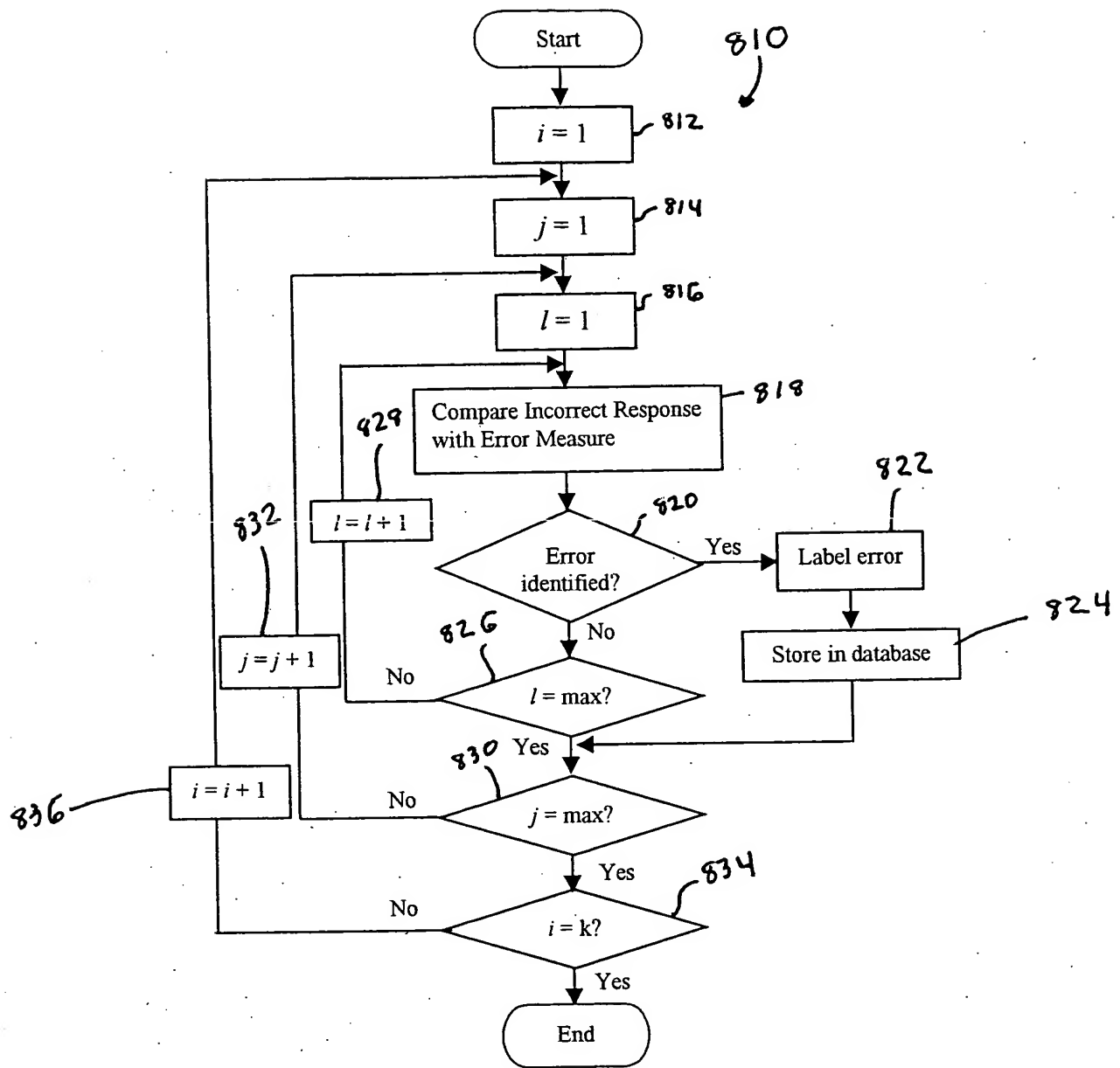


Figure 2 A



$(ST)_i$ : Subtest;  $i = 1 \dots k$

$(IR)_{ij}$ : Incorrect Response;  $ij = 1.1, 1.2, \dots, 1.\max., \dots k.1, k.2, \dots, k.\max.$  ( $j = 1 \dots \max.$ )

$(EM)_{il}$ : Error Measure;  $il = 1.1, 1.2, \dots, 1.\max., \dots k.1, k.2, \dots, k.\max.$  ( $l = 1 \dots \max.$   
Note:  $\max.$  for  $l$  is different from  $\max.$  for  $j$ .)

Figure 2B

# IF-THEN Rule Bases

Subtest	Error Measure						
1. Rhyme Recognition	(1)		(2)		(3)	(4) ...	$\eta_1$
2. Rhyme Generation	(1)		(2)		(3)	(4) ...	$\eta_2$
3. Beginning and Ending Sounds	(1)	Rule 2	(2)	Rule 1	(3)	(4) ...	$\eta_3$
4. Blending	(1)		(2)	Rule 3	(3)	(4) ...	$\eta_4$
5. Segmenting	(1)		(2)		(3)	(4) ...	$\eta_5$
6. Manipulating	(1)		(2)		(3)	(4) ...	$\eta_6$
7. Recalling in Sequential Order	(1)		(2)		(3)	(4) ...	$\eta_7$
8. Rapid Naming	(1)		(2)		(3)	(4) ...	$\eta_8$
9. Letter Names and Sound	(1)		(2)		(3)	(4) ...	$\eta_9$
10. Decoding	(1)		(2)		(3)	(4) ...	$\eta_{10}$
11. Fluent Reading	(1)		(2)		(3)	(4) ...	$\eta_{11}$

FIGURE 2C

Subtest	Error Measure ID	Error Measure
3. Beginning and Ending Sounds	2	Do not recognize /f/ when it is at the end following an /i/ sound
4. Blending	3	Can not blend when /f/ is at the end following an /e/ sound
5. Segmenting	4	Do not count /f/ when it is at the end following an /Δ/ sound
6. Manipulating	4	Can not replace /f/ with /v/ when it is at the end following an /e/ sound
7. Recalling in Sequential Order	3	Do not recall /f/ when it is at the end following another consonant.
9. Letter Names and Sound	4	Can not recognize /f/ sound when it is isolated
10. Decoding	2	Cannot recognize the nonsense word when the word ends with a /f/ sound which follows another consonant

FIGURE 2D



## DIAGNOSTIC TOOL

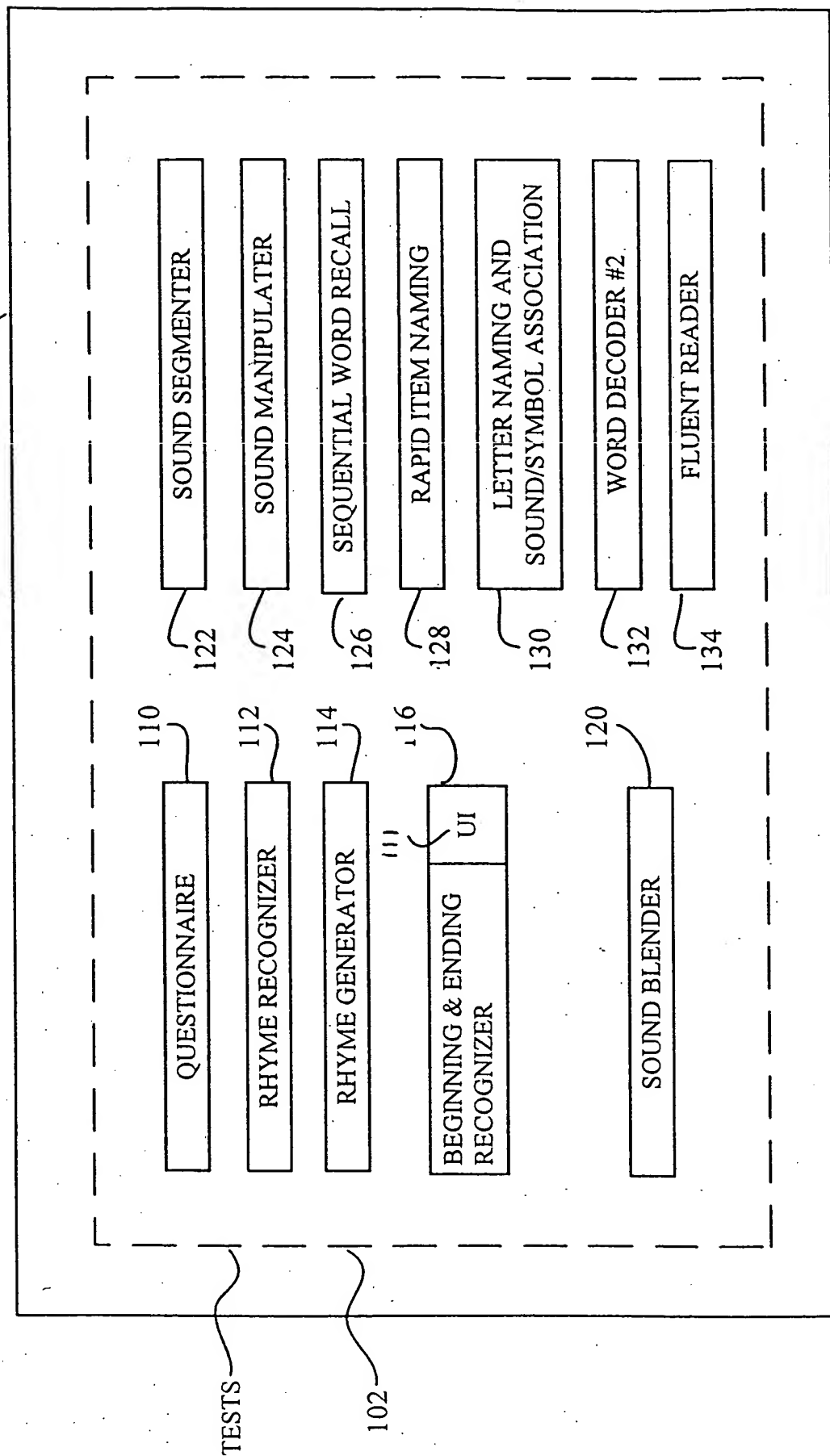


Figure 3

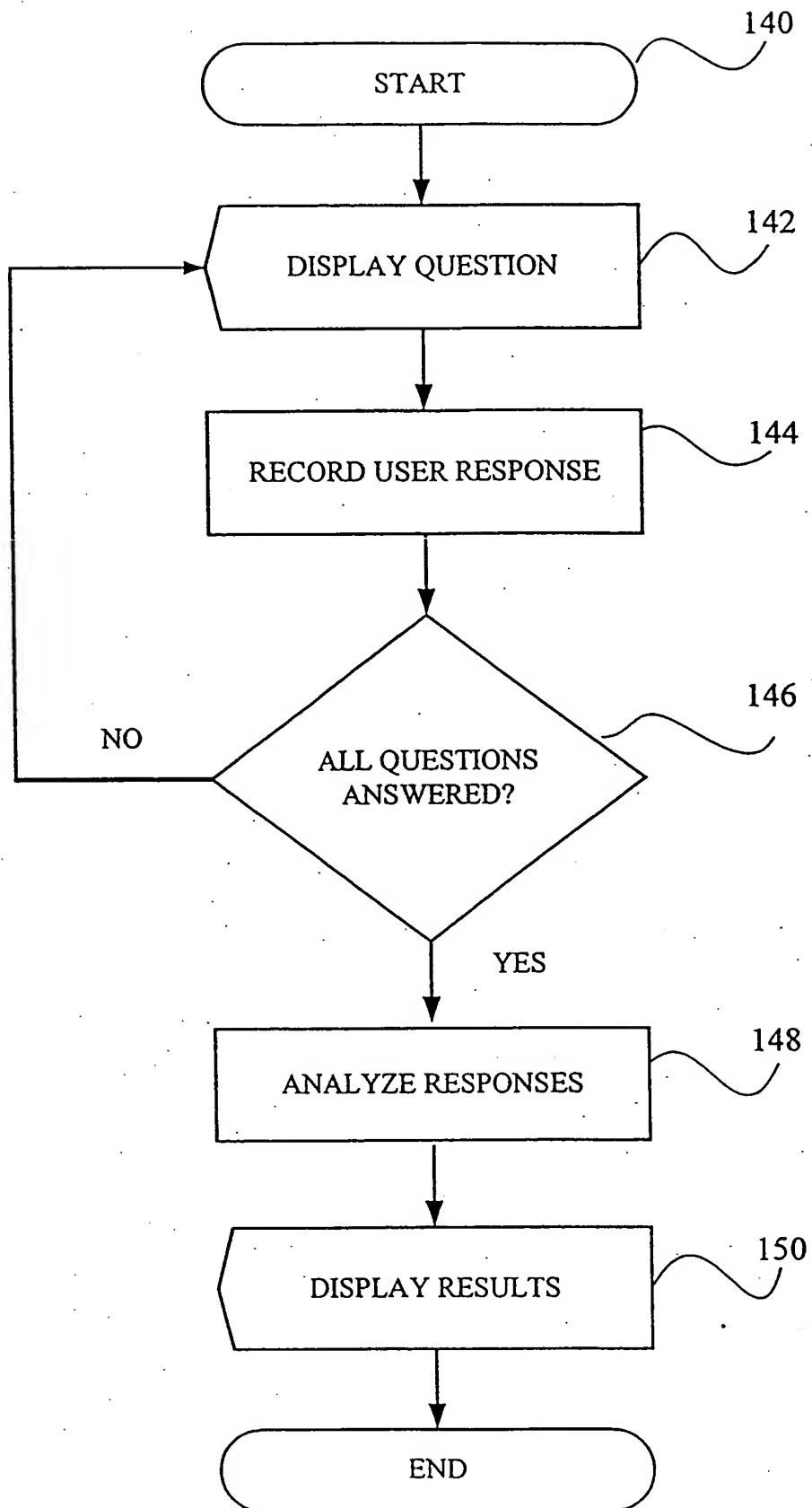


Figure 4

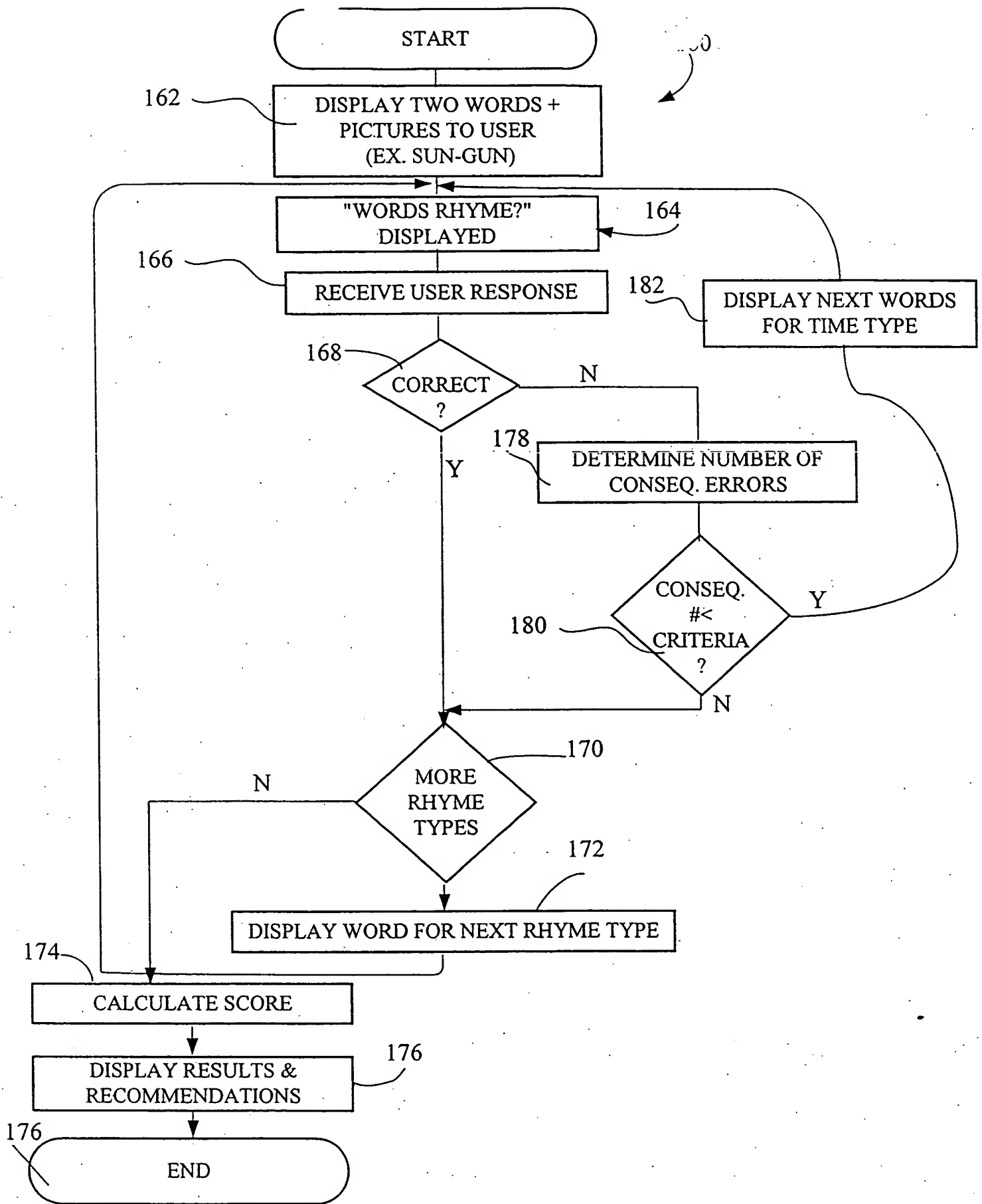
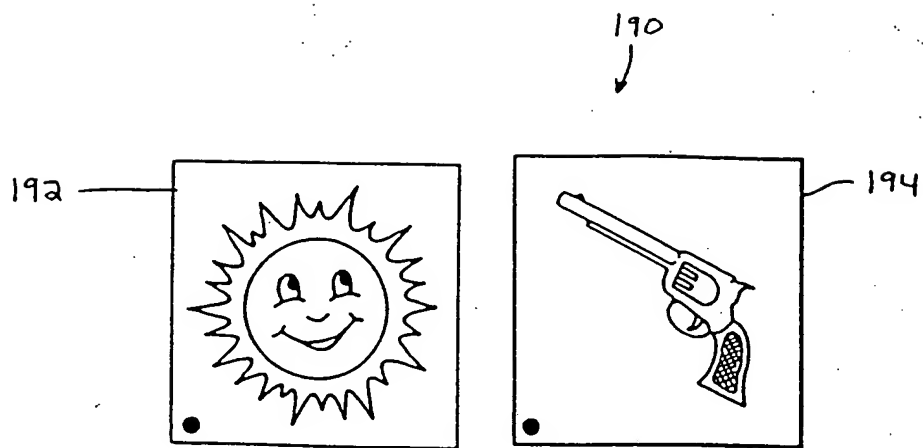


Figure 5



WORDS RHYME? } 196

198 — YES — NO — 200

Figure 6

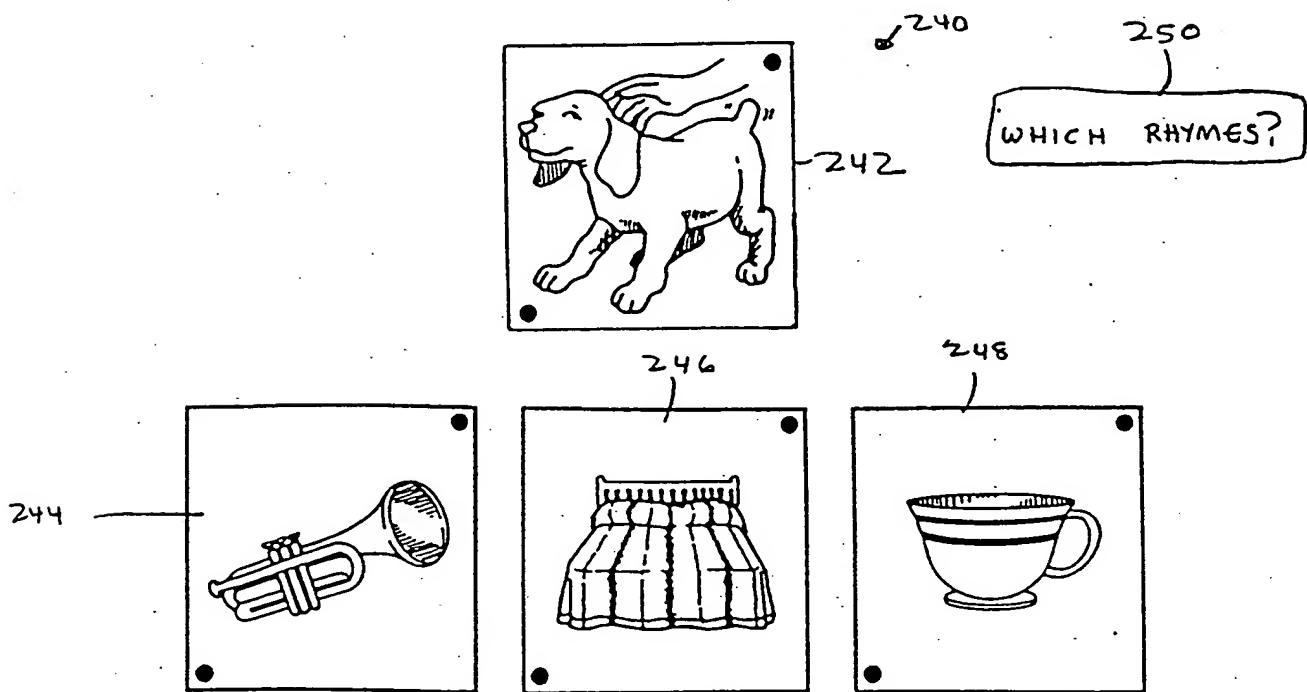


Figure 8

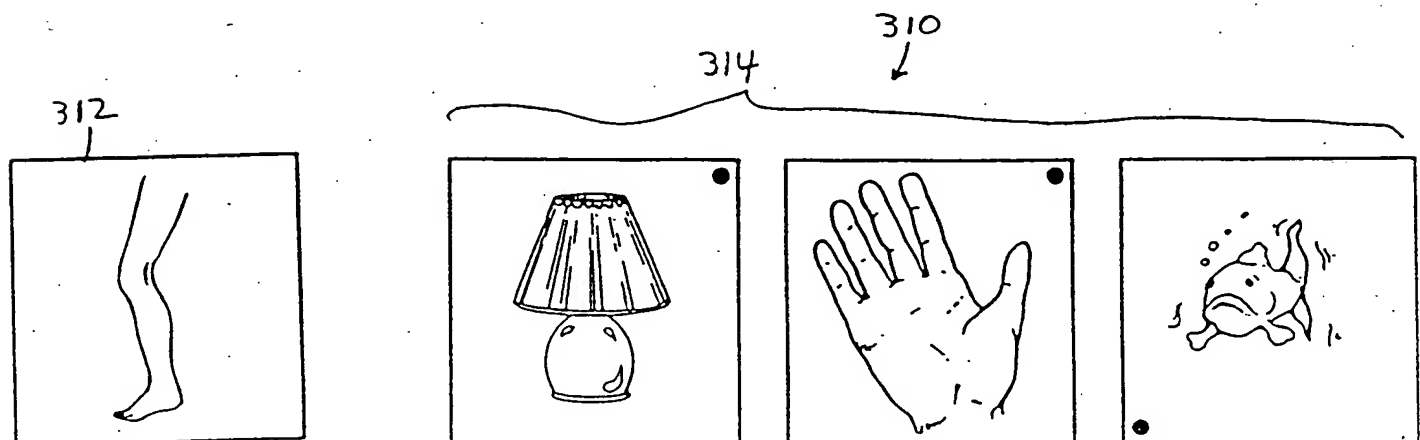


FIGURE 10

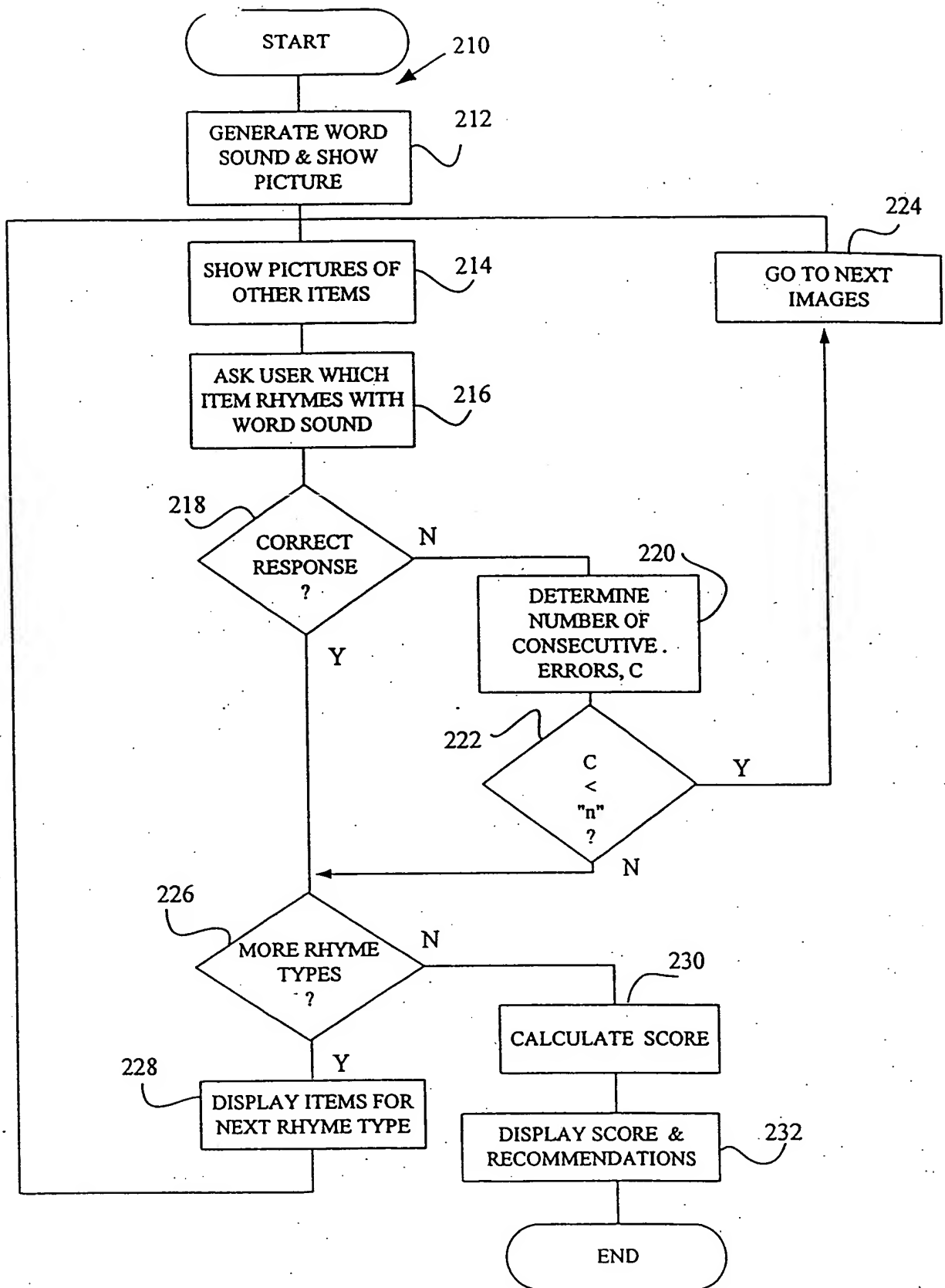


Figure 7

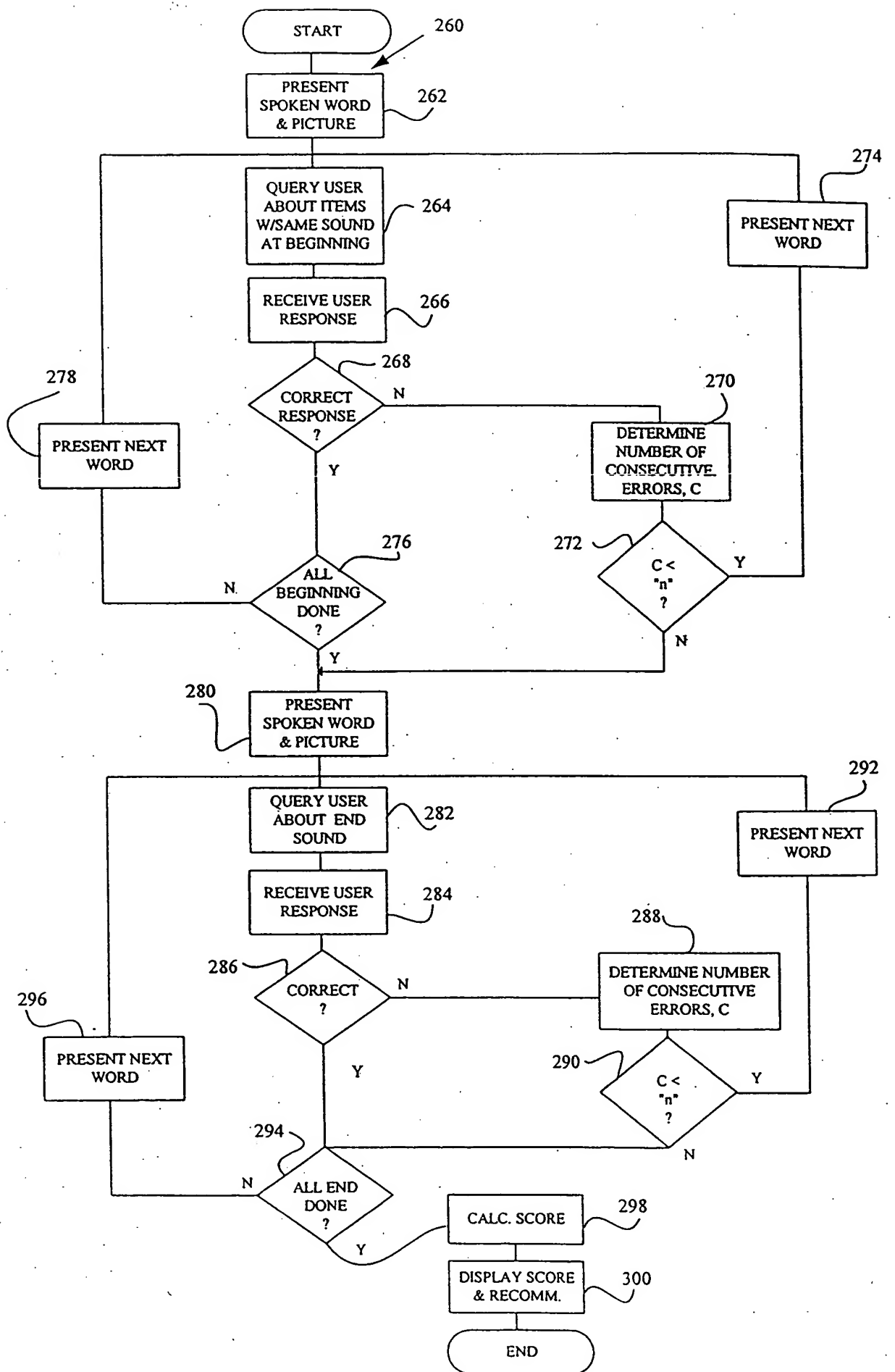


Figure 9

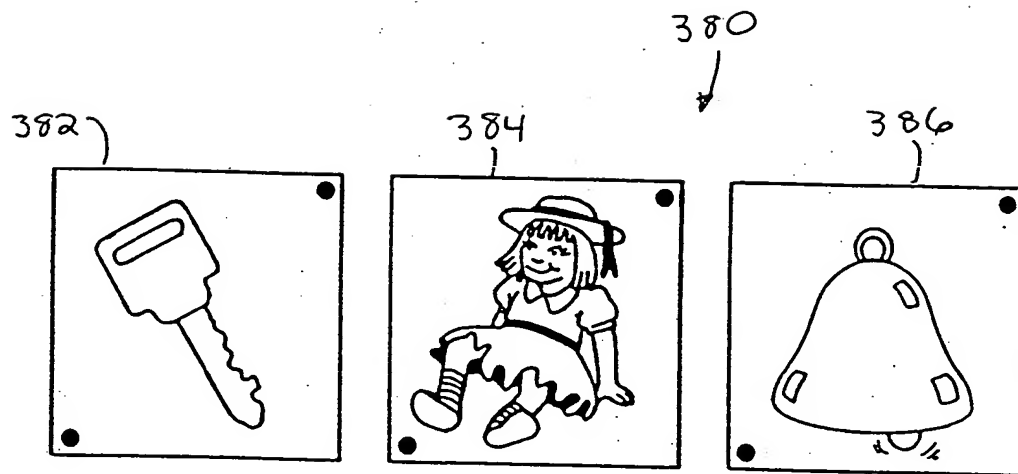


Figure 12

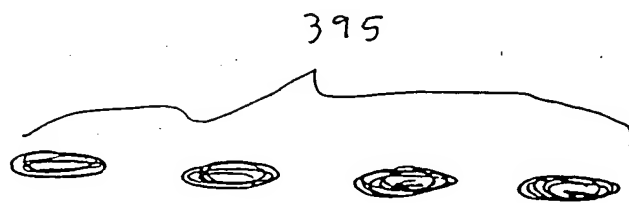


Figure 14

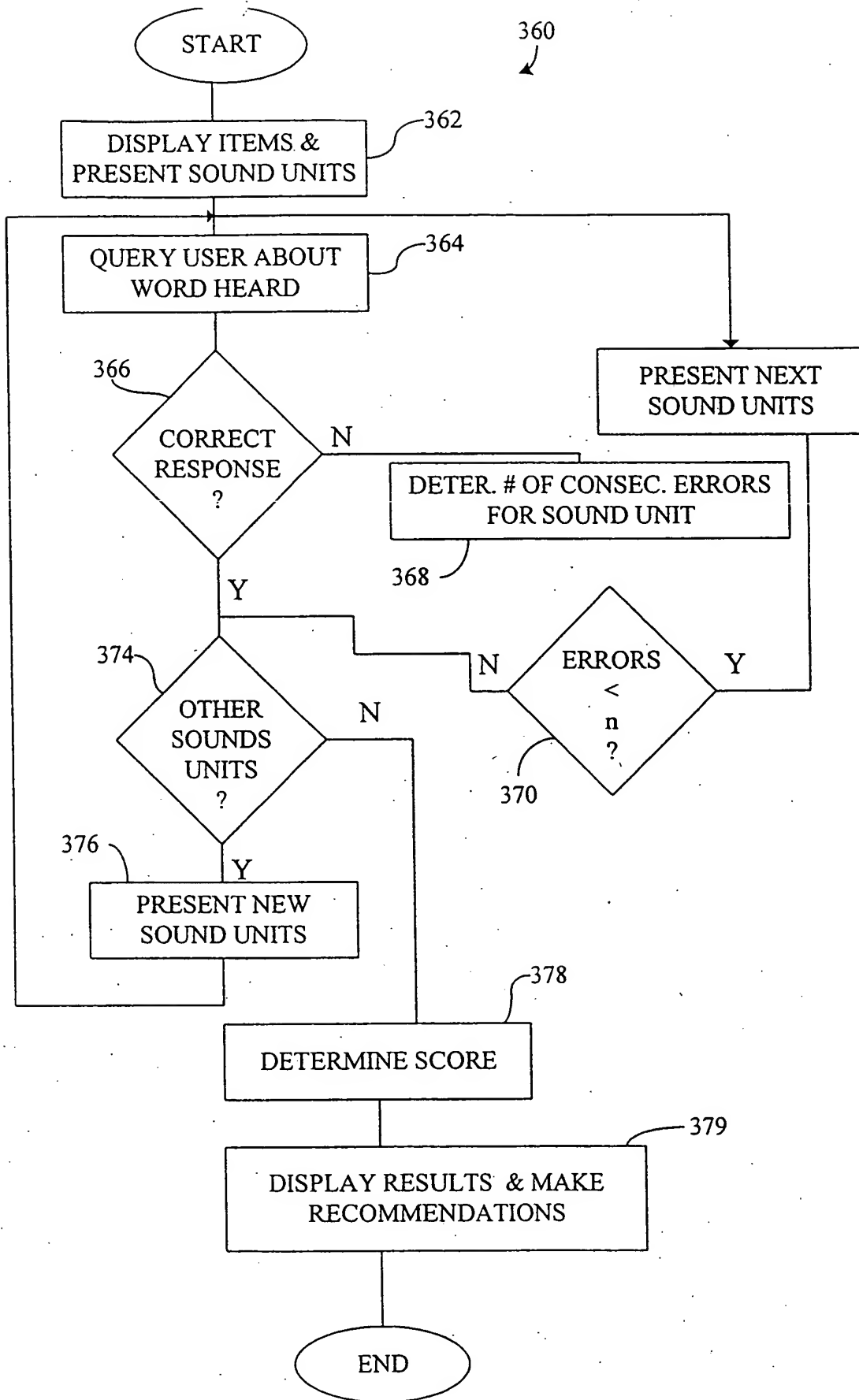


Figure 11



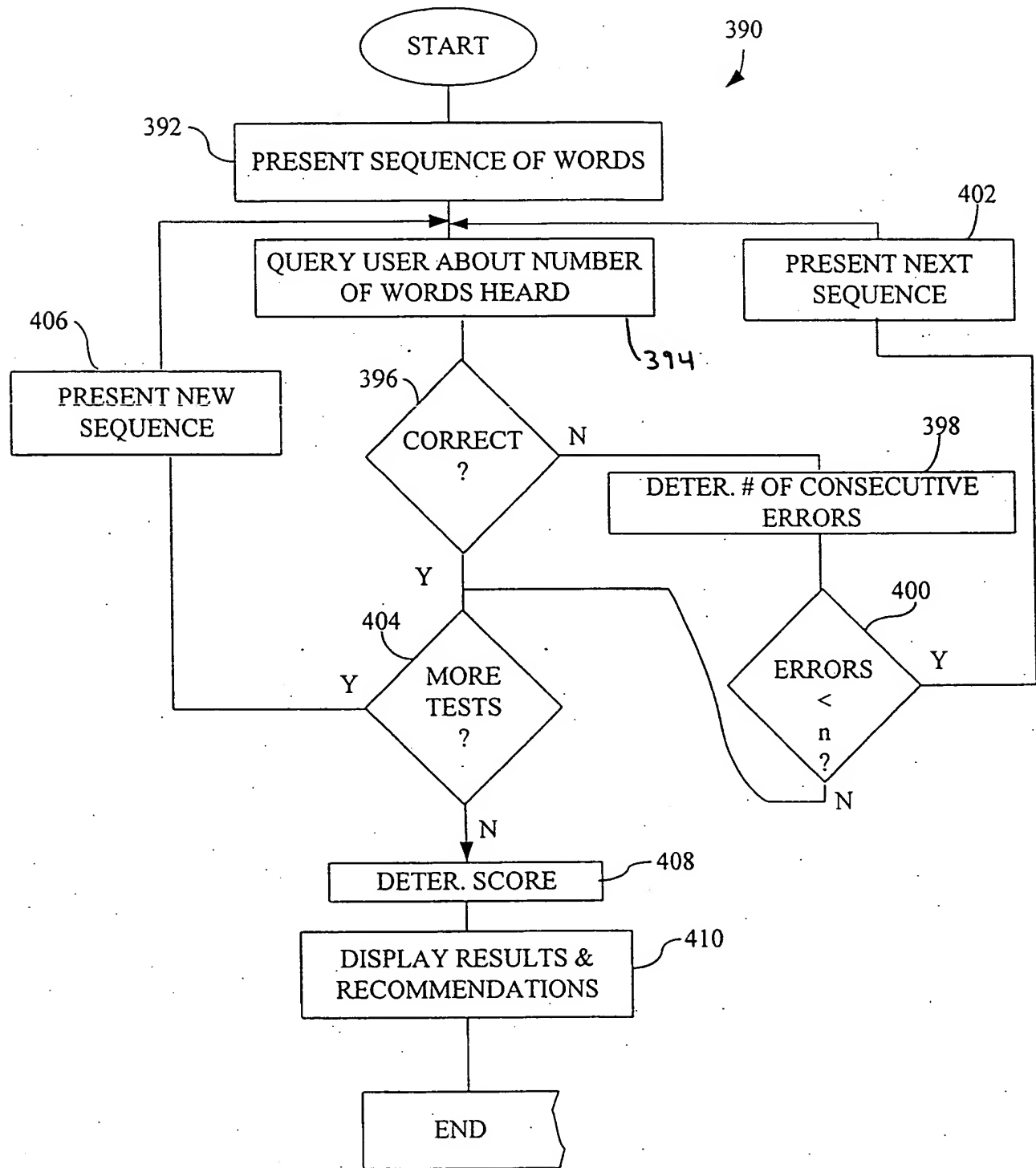


Figure 13

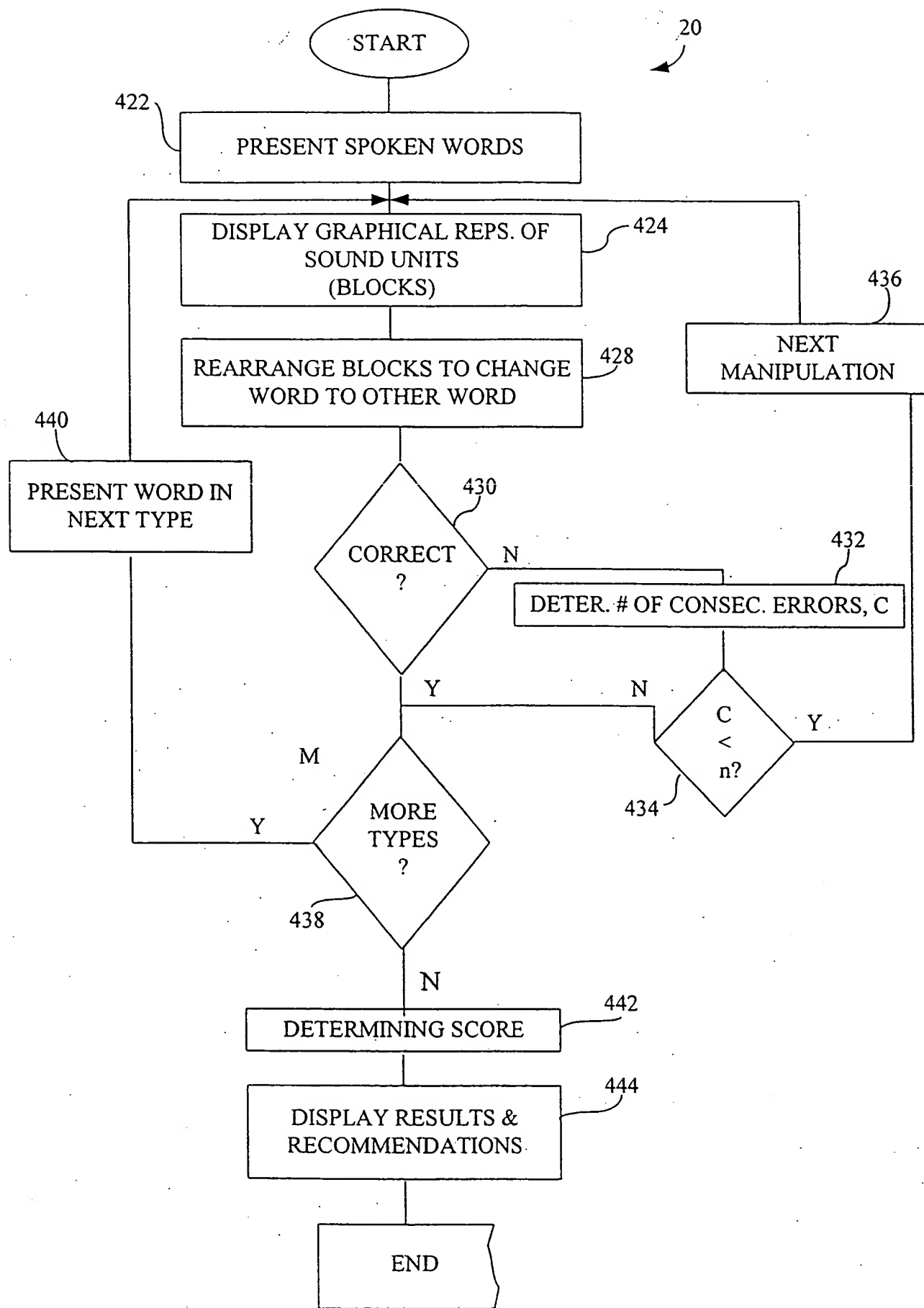


Figure 15

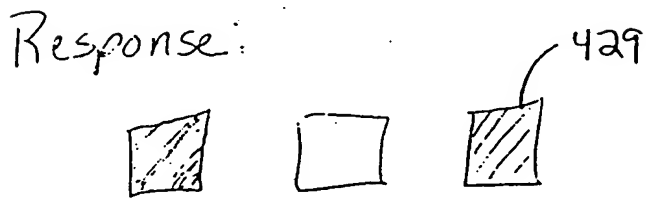
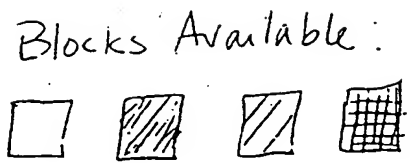
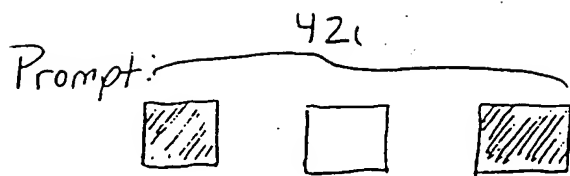


Figure 16

1	6	2
4		9
5	8	3

Figure 18

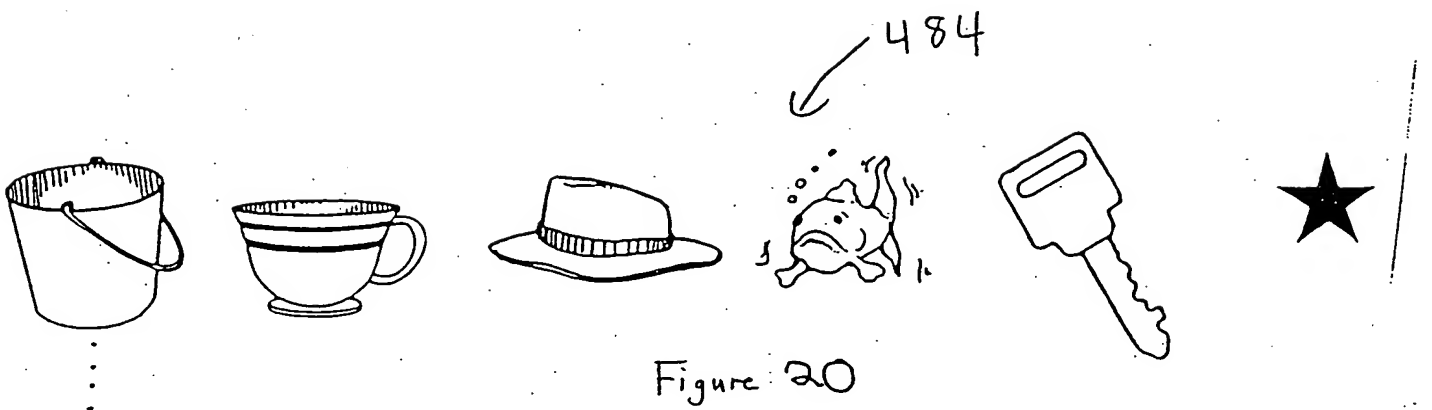


Figure 20

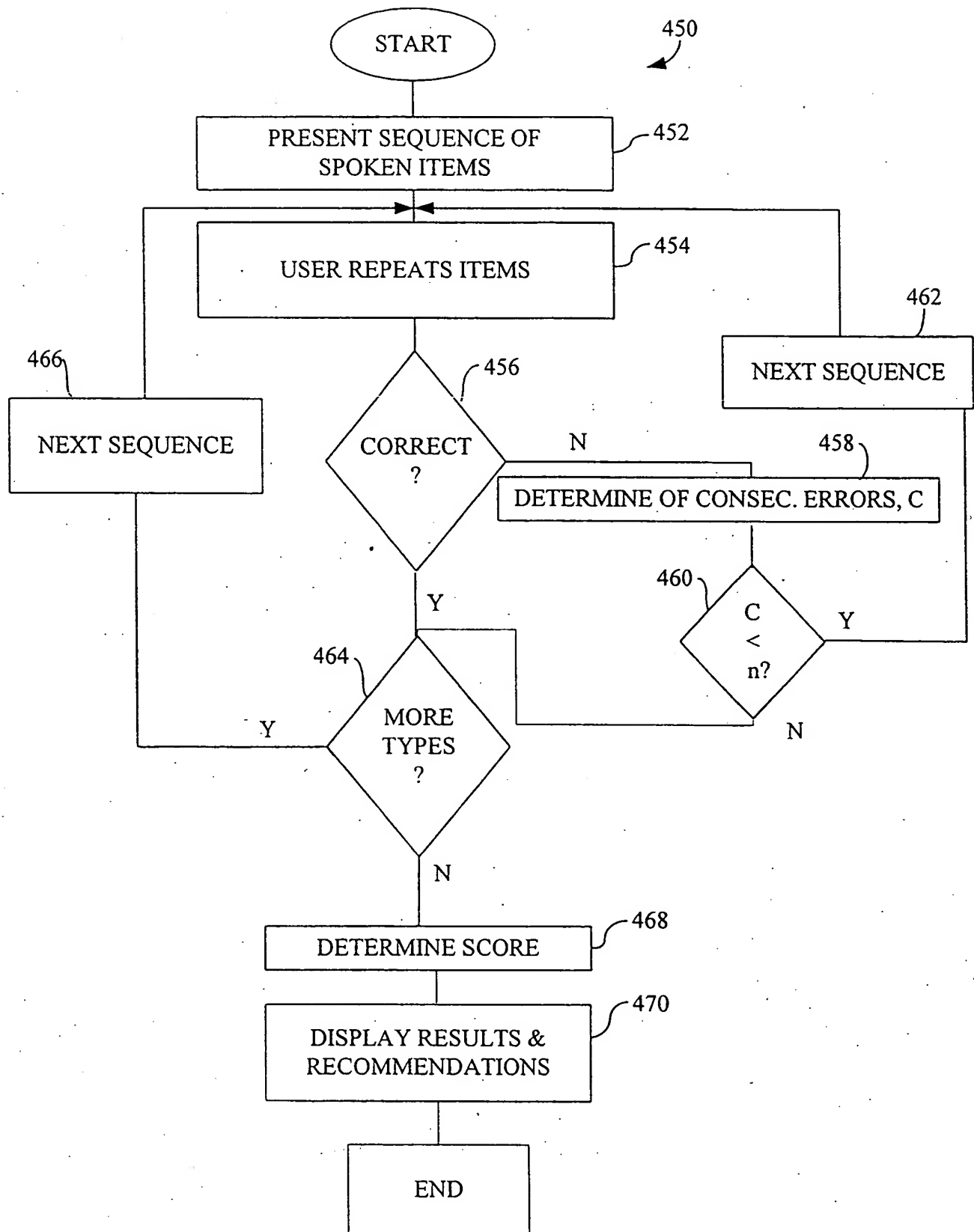


Figure 17

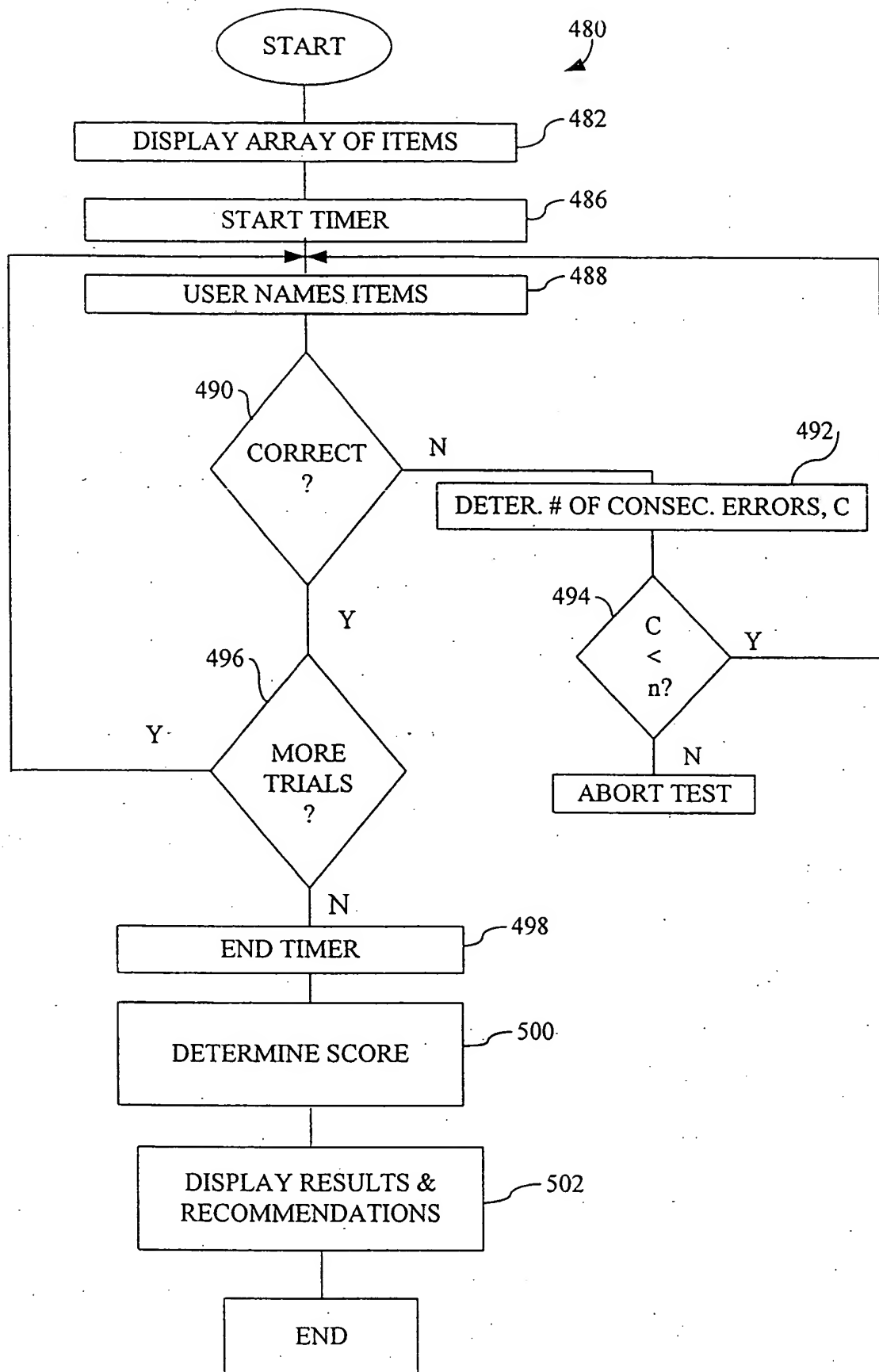


Figure 19

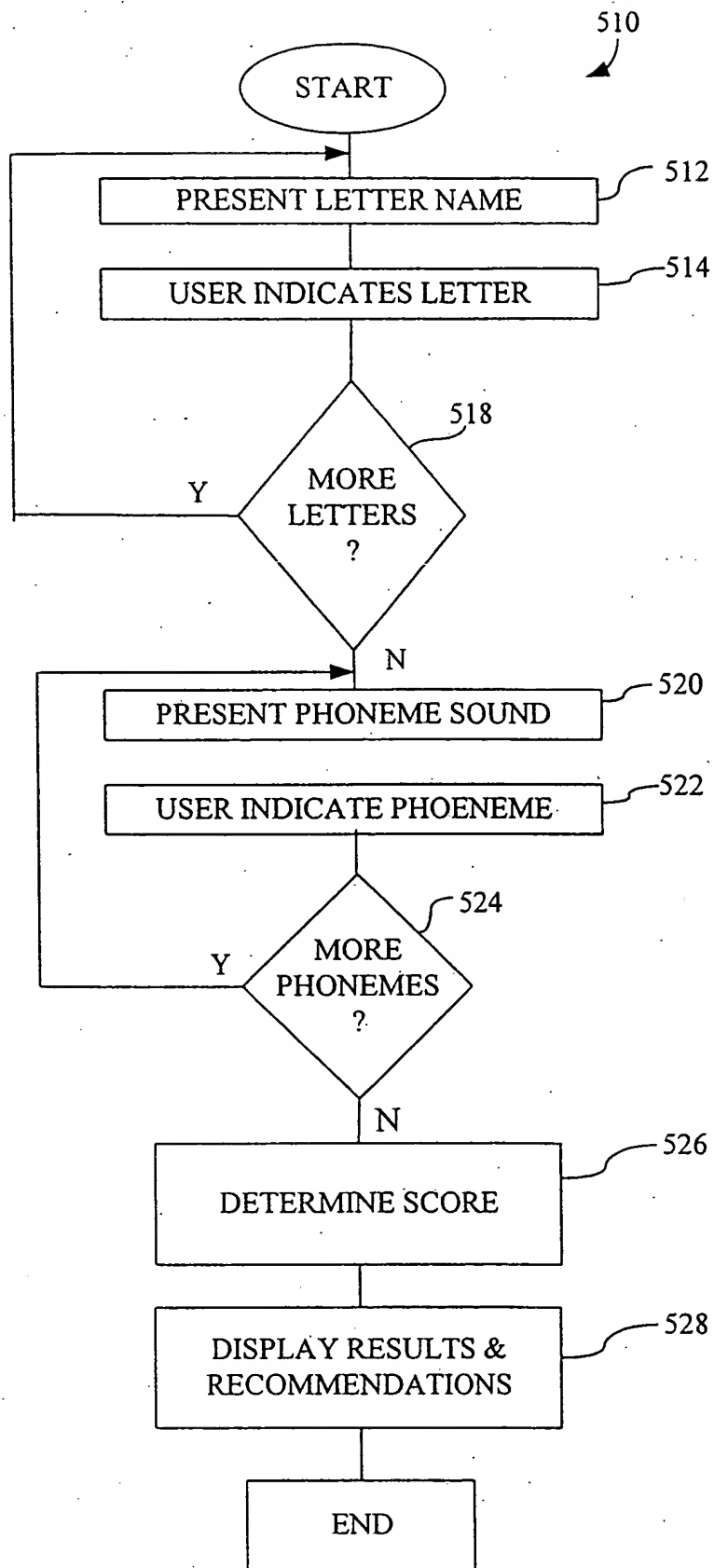


Figure 21

A	B	C	D	E	F		
G	H	I	J	K	L		
M	N	O	P	Q	R		
S	T	U	V	W	X	Y	Z

516 ↙

Figure 22

+af
cag
dop
mib

533 ↙

Figure 24

Does a dog have four legs? ] 564

YES
NO

566

Figure 26

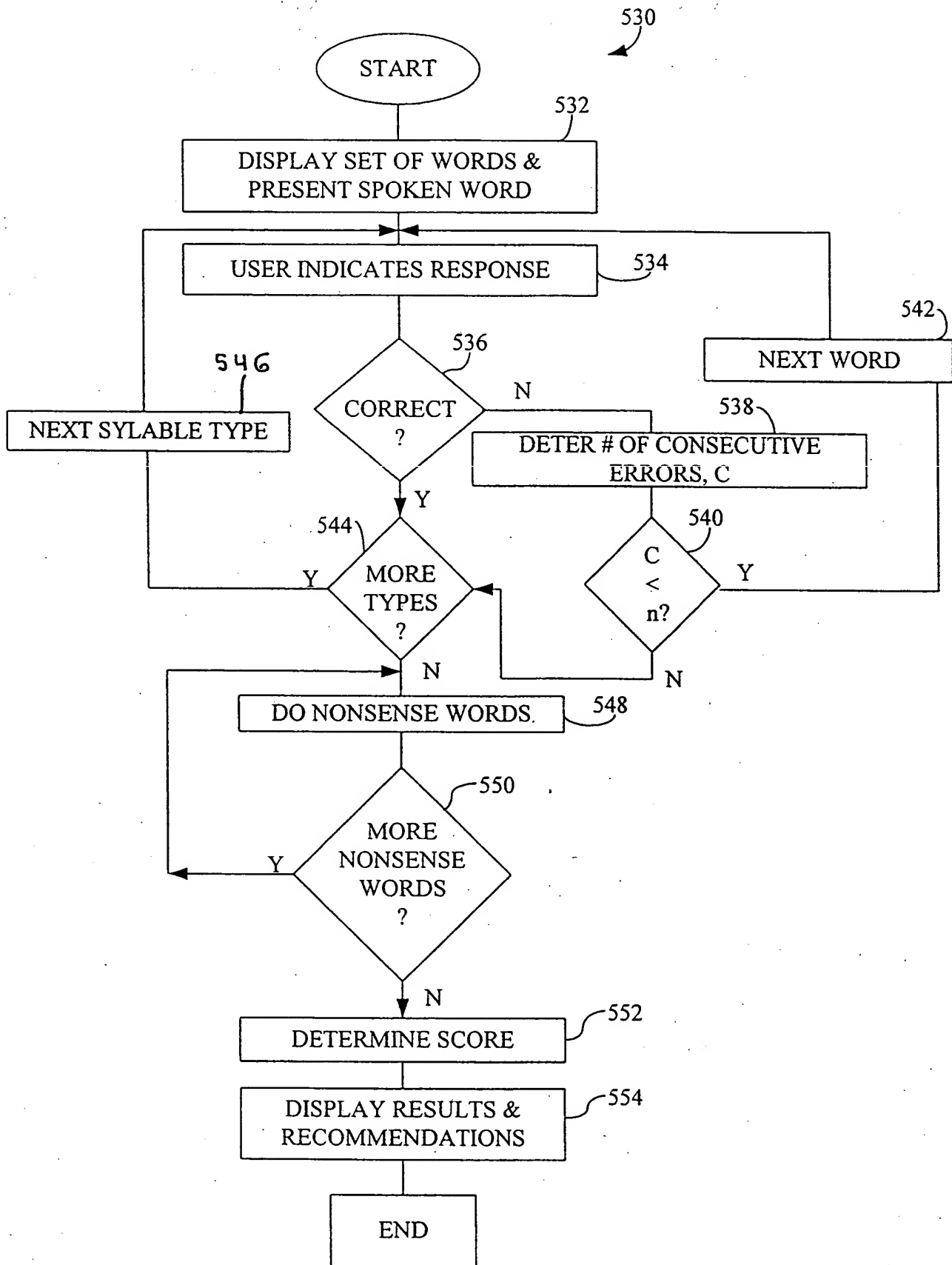


Figure 23



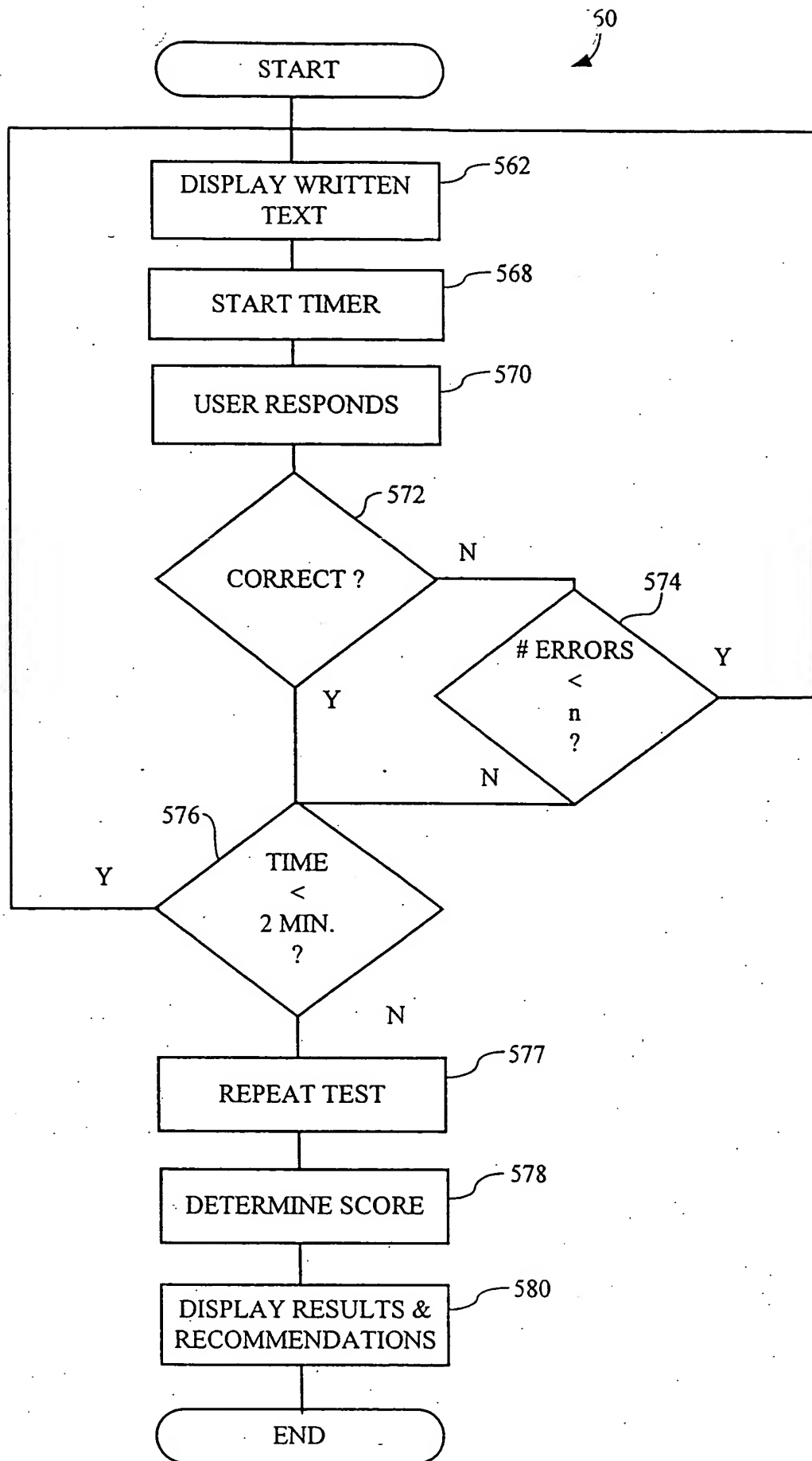
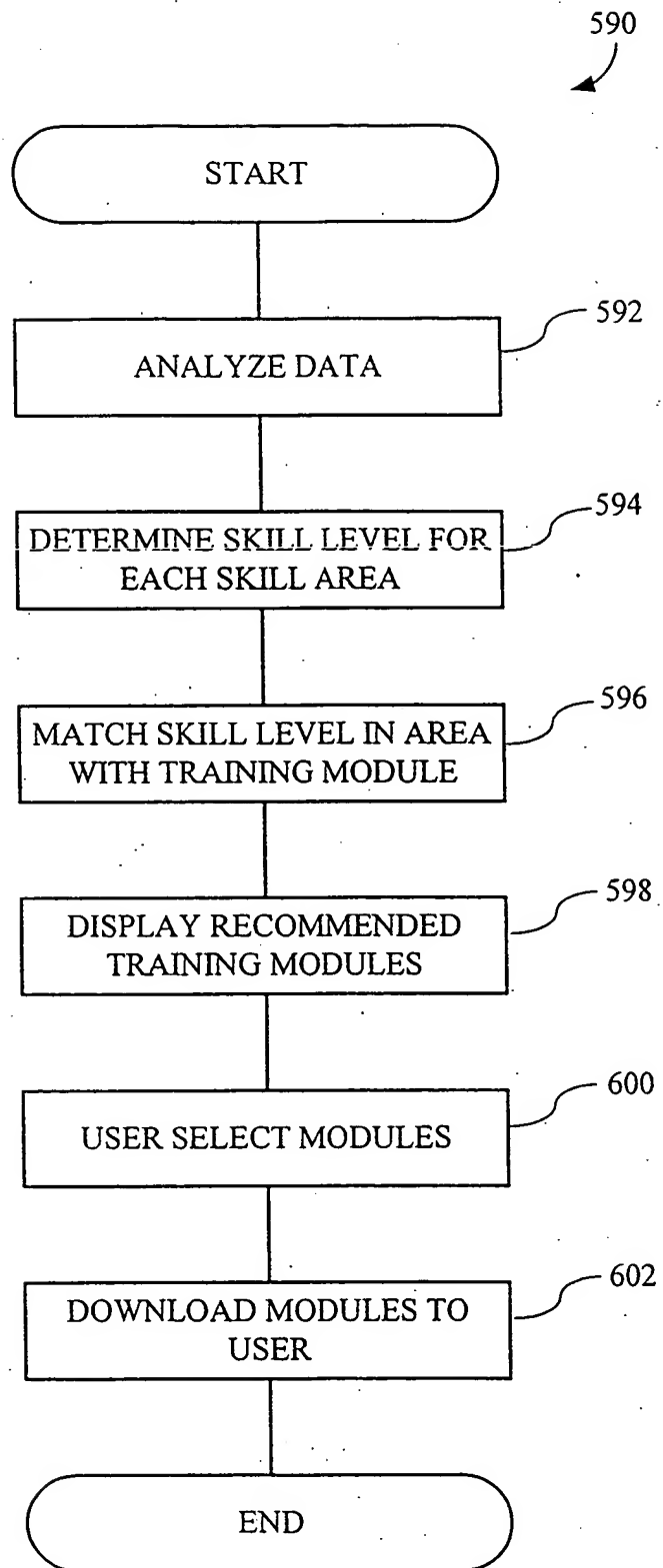


Figure 25



**Figure 27**

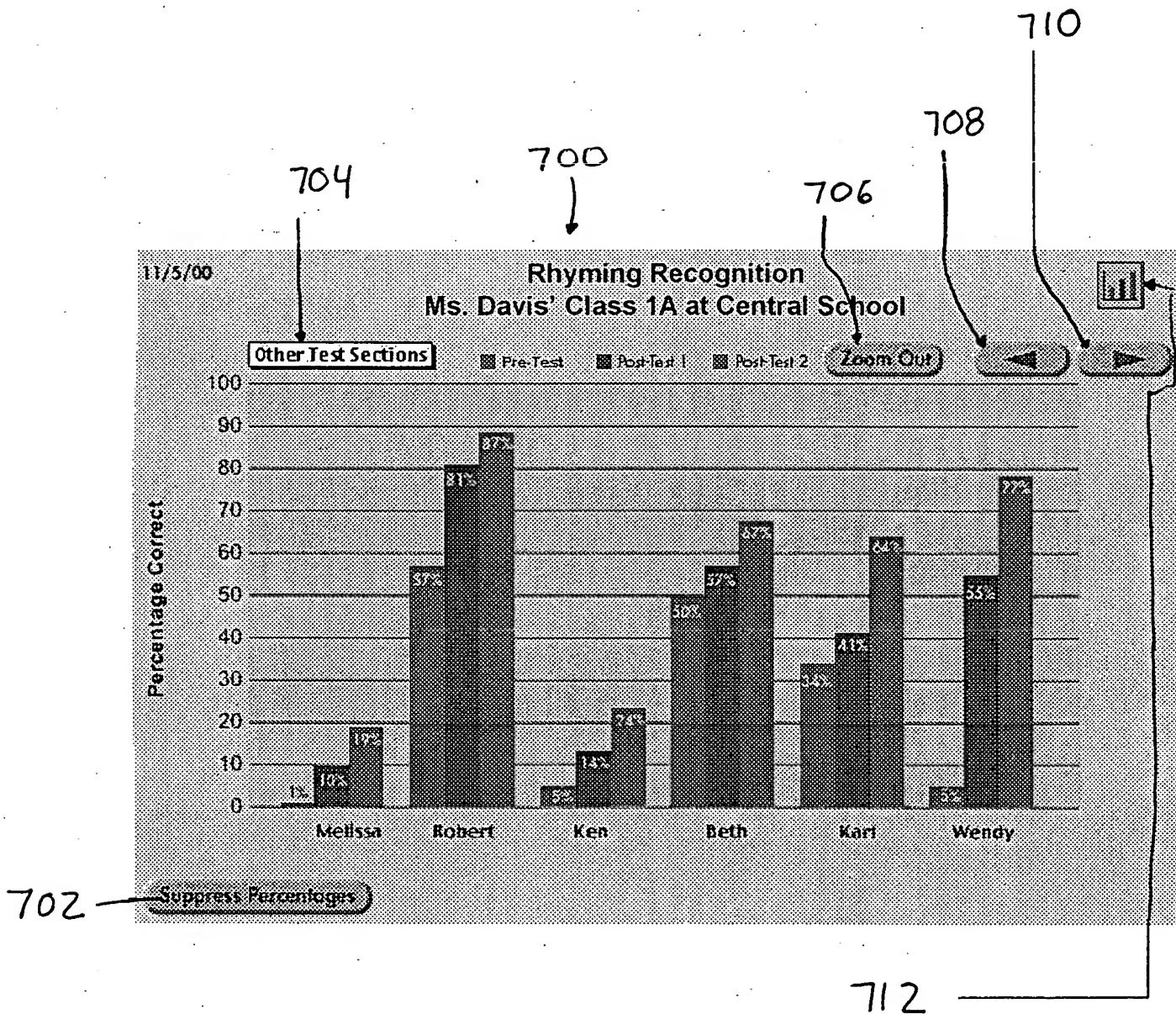
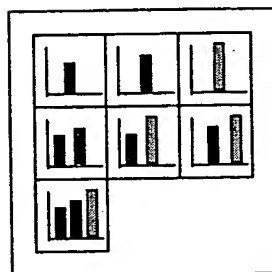


Figure 28

Rhyme Recognition
Rhyme Generation
Beginning and Ending Sounds
Blending
Segmenting
Manipulating
Recalling in Sequential Order
Rapid Naming
Letter Names and Sound
Decoding
Fluent Reading

740

Figure 29



750

Figure 30

